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Foreign American History Mss. Copies in Library of Congress

GRACE G. GRIFFIN

To meet the increasing demands of scholars for source material in writing American history, the Library of Congress in the early years of its expansion under the direction of Dr. Herbert Putnam, Librarian, initiated a program for copying manuscripts in foreign archives relating to American history. In undertaking this project the Librarian obtained the advice and cooperation of the Department of Historical Research of the Carnegie Institution of Washington, Dr. J. Franklin Jameson, Director, and of the Council of the American Historical Association. The work was begun in 1905, in the British archives, by obtaining transcripts of manuscripts in the British Museum and the Public Record Office in London, and the Bodleian Library at Oxford. The papers were selected chiefly by Professor Charles M. Andrews, of Yale University. Actual work of transcription was given to Messrs. B. F. Stevens and Brown, a firm founded by B. F. Stevens.

The work of systematically obtaining transcripts from official manuscripts in the archives of the French government relating to the United States was entered upon in 1913, under the immediate supervision of Mr. Waldo G. Leland, of the Carnegie Institution of Washington.

In 1913 the Library of Congress entered into a cooperative arrangement with the University of Texas and the University of California to obtain transcripts from the Mexican archives. Mr. W. E. Dunn, of the University of Texas, was given direction of the work. In 1915 a series of Spanish transcripts from Mexican archives, relating to Spanish Texas and New Mexico, was purchased through Professor Herbert E. Bolton, of the University of California, and later, beginning in 1926, further acquisitions from the Mexican archives were secured through Professor Charles W. Hackett of the University of Texas.

A collection of blueprint copies of 1,260 pages of typewritten tran-

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scripts of documents of the late eighteenth and early nineteenth centuries in the Archivo Nacional de Cuba, Havana, relating to Spanish trade, Indian affairs, etc., in the Floridas and Louisiana was procured by an arrangement with Miss Elizabeth H. West, then Archivist of the Texas State Library.

In 1914 photographic copies of a number of documents in the imperial archives at Petrograd were obtained through Dr. F. A. Golder. These papers relate to the early expeditions of the Russians to America and the activities of the Russian-American Company in Alaska.

The work of copying documents relating to America in the Spanish archives was begun in the Archivo General de Indias, at Seville, in 1914, under the direction of Mr. W. E. Dunn, of the University of Texas. The transcripts made in Spain were typewritten, as distinguished from those made in England and France, which were handwritten. Later activities were carried on in the Archivo General de Simancas, and the Archivo Histórico Nacional at Madrid, and continued at varying rates of progress until stopped by a decree of the Spanish Government of August 12, 1927, prohibiting all copying, in series, of documents in Spanish official archives. Fortunately this order was later revoked, thus enabling the Library of Congress to procure reproductions of many thousand pages of manuscripts in Spanish archives under the Rockefeller project described below.

With the purchase, in 1906, of the Benjamin Franklin Stevens *Catalogue Index of Manuscripts in the Archives of England, France, Holland and Spain, Relating to America, 1763-1783,* in 180 volumes containing the titles of 101,000 documents, the Library also obtained 37 portfolios of transcripts of unpublished manuscripts in European archives relating to America, 1772-1784. Of this series, 18 portfolios contained 10,928 pages of peace transcripts—transcripts made from the English and French archives relating to the peace negotiations of 1783 between the United States and Great Britain, and dating from March 22, 1782, to May 25, 1784. The remaining 19 portfolios contained transcripts of documents relating to the French alliance with the United States. From the same firm were also purchased 24 portfolios containing facsimiles of 2,107 documents in European archives relating to America, 1773-1783, none of which are included in the peace transcripts.

The results accumulated in the course of these 23 years (1905-1927) amount to 300,000 or more transcripts and facsimiles of original manuscripts in foreign archives.

In 1927, under a generous grant from Mr. John D. Rockefeller, Jr., a more comprehensive project of copying manuscripts relating to the history of America, in practically all the countries of Europe and in Canada and Mexico, was undertaken. The direction and supervision of the project was undertaken by the Chief of the Division of Manuscripts of the Library of Congress, Dr. J. Franklin Jameson, and has been continued by the present chief of the Division, Dr. St. George L. Sioussat. Professor Samuel F. Bemis was appointed director of the European mission of the Library for a period of two years, to initiate and superintend the work in various countries of Europe. Dr. T. P. Martin was appointed special assistant in the Division of Manuscripts in care of the material as it was received at the Library. This position is now held by Miss Grace Gardner Griffin. Research assistants for selecting the material and superintending the photographing were appointed for Great Britain, France, Germany, Spain, Italy, Sweden, Norway, Denmark, as also for Canada and Mexico. The project was sponsored by Mr. Rockefeller for a period of five years (September 1, 1927—August 31, 1932), then extended for two years. Since that time the work has proceeded on a smaller scale as a regular activity of the Library of Congress, under the direction of the Chief of the Division of Manuscripts. The acquisitions are now limited, as a continuous program, to those in the Public Record Office, London. From time to time, however, special projects of copying in other depositories are undertaken.

At the commencement of the Rockefeller project (familiarly known as "Project A") a change in the form of copying was made; transcripts were discontinued, and photocopies, either photostats or photofilms (and enlargement prints), were substituted. Thus the larger part of the Library's collection, which has been acquired under the new arrangement, is in photographic form. The decision as to method of photocopying, by photostat or by photofilm, was determined by varying circumstances. For instance, through the good offices of, and as a gift from, Mr. James B. Wilbur, photostat machines were installed in the British Museum and at the Public Record Office, London. Therefore the photo-

graphic copying done at these depositories has been in the form of photostats, mainly negative photostats. Later (in 1928) a Lemare apparatus, with 35mm. miniature films (for subsequent enlargement) was installed in the tower of the House of Lords, and subsequently in minor London archives. In April, 1928, at the Archives Nationales, Paris, a room was provided for the photographic apparatus (photostat machine) of the Library of Congress, and in June of that year photographic apparatus of another kind (Lemare camera) was put in use at the Archives du Ministère des Affaires Etrangères, also at Paris. In Spain in 1928 a Lemare camera and apparatus were installed at the Royal Academy of History and the Archivo Histórico Nacional, both at Madrid, at the Archivo General de Simancas, and at Seville (Archivo General de Indias). A Lemare apparatus was installed in the Rijksarchief, The Hague, in November, 1928. Work was commenced in Germany in November: In Hamburg a Lemare apparatus was used in the Staatsarchiv at the Rathaus; in Berlin-Dahlem the Preussisches Geheimes Staatsarchiv allowed the installation of a photostat apparatus (Kontophot). In Sweden, Norway and Denmark a moderate program of work was initiated in 1929; at the Riksarkivet, Stockholm, and later there and at the Universitetsbiblioteket at Oslo, a film apparatus, the invention of Mr. Türe Sellman (similar to the Lemare process) was used. In Italy photostats were procured from the Vatican archives; but for all the Italian state archives a camera was used. The copying in the Canadian archives was partly in photostats and partly in photofilms and enlargement prints.

Since the beginning of "Project A" in 1927, the total acquisitions represent 2,439,887 pages of manuscripts. This is, of course, additional to the large collection (somewhat over 300,000 pages) of transcripts received during the period from 1905 to 1927. There are thus nearly 3,000,000 pages of manuscripts represented in this collection.

The printed guides issued by the Carnegie Institution of Washington form the basis upon which the selection of material to be copied has been made. These are:

GREAT BRITAIN: *Guide to the Materials for American History, to 1783, in the Public Record Office of Great Britain,* by Charles M. Andrews (Washington, 1912-14, 2v.); *Guide to the Materials in London Archives for the History of the United States Since 1783,* by Charles O. Paullin and Frederic

L. Paxson (Washington, 1914); and *Guide to the Manuscript Materials for the History of the United States to 1783, in the British Museum, in Minor London Archives, and in the Libraries of Oxford and Cambridge,* by Charles M. Andrews and Frances G. Davenport (Washington, 1908); and (for Canada) *Guide to Materials for United States History in Canadian Archives,* by David W. Parker (Washington, 1913); and *Guide to British West Indian Archive Materials, in London and in the Islands, for the History of the United States,* by Herbert C. Bell, David W. Parker and others (Washington, 1926).

FRANCE: *Guide to Materials for American History in the Libraries and Archives of Paris, Vol. I: Libraries* (Washington, 1932). (At the time of the copying for the Library of Congress in France, this *Guide* was in manuscript only.)

SPAIN: *Guide to the Materials for the History of the United States in Spanish Archives (Simancas, the Archivo Histórico Nacional, and Seville),* by William R. Shepherd (Washington, 1907); and *Descriptive Catalogue of the Documents Relating to the History of the United States in the Papeles Procedentes de Cuba Deposited in the Archivo General de Indias at Seville,* by Roscoe R. Hill (Washington, 1916).

GERMANY: *Guide to Manuscript Materials Relating to American History in the German State Archives,* by Marion Dexter Learned (Washington, 1912).

SWITZERLAND AND AUSTRIA: *Guide to the Materials for American History in Swiss and Austrian Archives,* by Albert B. Faust (Washington, 1916).

ITALY: *Guide to the Materials for American History in Roman and Other Italian Archives,* by Carl Russell Fish (Washington, 1911).

MEXICO: *Guide to Materials for the History of the United States in the Principal Archives of Mexico,* by Herbert E. Bolton (Washington, 1913).

The Library of Congress does not, of course, have all the material noted in these guides, therefore comparison must be made with our inventory lists to determine what particular series and items have been copied. The accessions of each year have been described briefly in the successive annual reports of the Librarian of Congress since the beginning of this acquisition. The transcripts received prior to 1918 are described in detail in the *Handbook of Manuscripts in the Library of Congress* (Washington, 1918). For the later acquisitions, including the great collection received under the Rockefeller grant, and later from the income of the Wilbur Fund (The James B. Wilbur Fund for the Acquisition of Serviceable Reproductions of Manuscript Source Material on American History in European Archives), there are manuscript inventories, lists and card indexes in this Division. It is planned, as time and resources permit, to issue detailed guides or lists for the benefit of

those who wish to use the collection, especially for the benefit of scholars at a distance from Washington to whom the manuscript inventories, etc., in this Division are thus not available. A beginning has been made, in the form of a guide to the papers from that section of the Public Record Office, London, called "Foreign Office, America" and "Foreign Office, United States" (F.O. 4, 5 and 115). The series obtained from those classes consists of the communications ("instructions") sent by the Foreign Secretary in London to the British minister in the United States from 1791 on, and of the communications ("despatches") sent by the latter to the former. The series extends through 1871. This guide, or calendar, which has been prepared by the writer of this article, is now available for use in this Division, but, as it is as yet in typewritten form only, its use is restricted to investigators who come to this Library. It is hoped, however, that before long it will be possible to make it available in printed or multigraphed form. A summary list of our material from the Papeles de Cuba series in the Archivo General de Indias, referring to Hill's *Descriptive Catalogue* (above) for detailed description of the *legajos* reproduced for the collection, has been nearly completed, this also in typewritten form only, at present.

Owing to the wide range of the collection and diversity of subjects included, it is not possible in brief compass to give an adequate summary of its scope and contents. However, we may say that in general it consists of: (1) manuscripts dealing with the history of the United States during the period when it was part of the colonial empires of various European countries (England, France, Spain, the Dutch Republic and Sweden), comprising the official correspondence and like material that passed between the administrators of the colonies in this country, on the one hand, and their superiors and other officials in the mother country, on the other; (2) papers illustrative of the relations, diplomatic, military and naval, between the United States, after it became an independent nation, and various foreign countries; (3) unprinted materials for the earlier cultural history of the United States, records of exploration, travel, religious groups, immigration and various other subjects.

This collection of reproductions may be used in this Division without restrictions. The transcripts, photostats and enlargement prints can be

sent for the use of scholars to other libraries under the usual procedure for interlibrary loans, with the additional stipulation that they be treated as manuscript and locked in a safe place when not in actual use. The photofilms are not allowed to be sent on interlibrary loan; they may, however, be used in this Division. For this purpose a reading machine (Argus) has been installed. It has been the policy of the Library to procure enlargement prints from the photofilms as fast as financial resources will permit, for the following reasons: (1) the photofilms are not available on interlibrary loan; (2) the enlargement prints are much more acceptable to historical investigators in that they are less of a strain to the eyes, and they are more convenient to use. Photographic copies (either photostats, photofilm enlargements, or photofilms alone, the latter of course the least expensive) can be obtained at prescribed rates. It is customary to furnish estimates of the cost to the inquirer, and the practice of the Library requires payment to accompany any order thereupon given.

The use of this material by interlibrary loan increases from year to year as the collection becomes more widely known among workers in the historical field. During the fiscal year from June 30, 1938, to June 30, 1939, 51,729 pages were sent on loan; 27 libraries were borrowers. During the same period photoduplication orders for the copying of material amounted to 23,770 pages of manuscripts.

Cataloging and Classifying Microfilm*

MAURICE F. TAUBER

LIBRARY problems raised by the introduction of textual photographs are generally similar to those encountered in the handling of other materials in non-codex form. In the past, special terminology and procedures have been devised as, for example, in the cataloging and classification of music, phonograph transcriptions, manuscripts, archives, broadsides, etc. It is not surprising, therefore, that with the coming of textual photographs catalogers and classifiers should hasten to prepare special techniques and forms to handle them, be they prints, photostats or the more recent microfilms. While it may be claimed that a film has a unique form, just as a map or a phonograph record, its content may be widely varied. A film may contain practically any kind of information, ranging in size from a single page, drawing, diagram, or chart to a set of volumes numbering thousands of pages and illustrations.

In a recent article, Dr. J. Periam Danton[1] stated that microfilms will be the medium whereby small or young libraries will be able to enrich their documentary and other fundamental research collections. While this may be particularly true of research libraries and of libraries of educational institutions, it also has significance for public libraries. A teacher of cataloging and classification, Dr. Harriet D. MacPherson,[2] would go even further in estimating the impact of microfilms upon libraries. She suggests that it is quite possible that microfilms may have such a tremendous effect upon library collections that whole systems of

* Based upon a paper presented at the winter meeting of the Chicago Regional Group of Catalogers and Classifiers, January 8, 1940, and a paper submitted in the course on Microphotography for Libraries, University of Chicago, Graduate Library School, Summer, 1939.

[1] "Microphotography in a University Library," *Journal of Documentary Reproduction*, I (Fall, 1938), 298.

[2] "The Philosophy of Classification and of Classifying," *Library Quarterly*, IX (July, 1939), 330-31.

ataloging and classification may be forced to undergo revision. Mr. R. H. Carruthers,[3] on the other hand, while recognizing both the value nd the problems that may be created by a heavy flow of microfilms nto libraries, concludes that "microfilms will always be an auxiliary, or they can never completely replace the present form of the book or he present form of reference materials." Since each of the last two deas is hypothetical and extreme, one might venture to suggest the bvious third possibility; namely, that the true center probably lies at point between these two views.

Microfilms, however, even in small quantities, do introduce new roblems for the librarian. Further, among the various departments of he library, the cataloging and classification departments receive the arger share of these problems. As yet no standard set of rules regard- ng the cataloging, classifying and mechanical preparation for photo- graphic reproductions has been developed. If standard practices in the rocedures for the preparation of microfilms are desirable, any attempt o formulate the criteria should be based on the assumption that stand- rdization will result in adequate service as well as in efficiency in echnical operations. By "adequate" is meant giving full satisfaction to he user in respect to his needs and time. While the service function f the library should be more important than the technical operations, he amount of service a library may render is dependent to some extent pon the work of the preparations department. And the funds avail- ble usually determine the extent of the technical operations in a par- icular institution. The purpose of this paper is to review the processes f acquisition, cataloging, classification and mechanical preparation of nicrofilms in libraries.

The literature dealing with the handling of textual photographs is nostly of recent vintage. In 1936, the first volume of *Microphotography or Libraries* appeared; in the same year Dr. Robert C. Binkley's *Manual n Reproducing Research Materials* was issued. In 1938, the JOURNAL OF DOCUMENTARY REPRODUCTION began publication. These have iven little or no attention to the problems of handling films from the oint of view of the cataloger. Mr. Keyes D. Metcalf's article, "*Care*

[3] "The Place of Microfilms in Public Library Reference Work," *Journal of Docu- entary Reproduction*, I (Summer, 1938), 267.

and Cataloging of Microfilms,"[4] which appeared in 1937, was the first to do so. Since that time there have been several other articles in various journals.[5] For the most part, these have amplified points made in preceding articles, with each writer adding one or more new factors. Thus, libraries had had several years in which to formulate rules when Mr. H. P. Brown, in 1939, made his survey[6] of prevailing practices in the handling of microfilms. Space limitations in the JOURNAL OF DOCUMENTARY REPRODUCTION, however, made it necessary for him to present his data in a curtailed fashion. The present paper uses some of Brown's data and attempts to expand his limited analysis.

In acquiring a book and making it available to the user, several processes are necessary in library procedure. Summarized, the method involves ordering, checking in the order, accessioning, and mechanical preparation. An unbound book may be sent to the bindery; a map or a manuscript may be mounted or laminated. In obtaining a film, a library without a photographic department of its own goes through processes similar to those for ordering books. An order is made on a photographic laboratory for the item (although more exact preliminary checking of bibliographical data may be necessary), and the material is carefully checked on receipt to discover any imperfections. From this point there is apt to be a considerable difference between the handling of a film and the handling of a book, and practices vary among institutions.

When a book is delivered to the technical department of a library, it is accessioned by an accessions clerk or a member of the cataloging staff if it has not already been accessioned by the order department. Some libraries do not accession each item separately. The various writers on the handling of films have been silent concerning the accessioning of this type of material, but it is worthy of attention if only for the record. Generally, it seems that libraries are not accessioning film strips. Actual numbering of films is unnecessary if the numerical clas-

[4] *A.L.A. Bulletin,* XXXI (February, 1937), 72-74.

[5] For example, W. E. Wright, "The Cataloging of Microfilm," *Library Journal,* LXIII (July, 1938), 531. Other articles are cited later in this paper.

[6] "A Survey of Microfilm Sources," *Journal of Documentary Reproduction,* II (June, 1939), 117-24. The writer is grateful to Dr. Brown, who loaned the original data collected in his survey.

sification system is used, particularly if serial numbers are employed. If not, and the library is concerned about knowing how many items it possesses, some other system of recording will be needed. It should be done simply if at all.

The system of accessioning used for books and other materials may logically be applied to films, but some librarians have found accessioning books a time-consuming practice of little or no actual value. In the case of microfilms, this practice is apt to be superfluous, and may add considerably to the costs of films, which in themselves are supposed to be a means of economy.[7] Two possible accessioning practices may be observed in the Huntington Library, which assigns accession numbers to each film title, and in the Hall Laboratories,[8] which splices film strips on related subjects into 100-foot reels and accessions the reels. In the latter case, a total count of titles must be recorded in some other way, perhaps by a running numerical tabulation.

At the outset in the discussion of classification, it may be well to note that a majority of the writers on the cataloging and classification of films have reached the general conclusion that while the cataloging of films is both desirable and necessary, the classification of films is neither. The assumption is made that films may not be consulted at the shelves. An important exception is the New York Public Library, which arranges its films according to the divisions of the library.[9] Moreover, an examination of the catalog cards of 12 libraries[10] reveals that some sort of classification is used in practically every case, even though the schemes may be rather simple. One might be presumptuous enough to speculate that if Miss MacPherson's prophecy regarding the extensive use of films is fulfilled, libraries will need to provide reading apparatus either in the stack tiers or in special rooms where the films

[7]H. H. Fussler, Some Aspects of Photographic Reproduction Affecting Library Service (1938), MS.

[8]Ross C. Cibella, *"The Filing and Cataloging of Microfilms"* (Mimeographed; 1939), p.2. Also appeared in *Special Libraries,* XXX (May-June, 1939), 160-62; this article, however, does not contain the sample cards.

[9]New York Public Library. "Memorandum on the Use of Films" (Mimeographed; 1937), p.3.

[10]Boston Public Library, Huntington Library, and the libraries of the University of Virginia, University of Michigan, Princeton University, Stanford University, University of Texas, Temple University, Harvard University, University of Missouri, Hall Laboratories, and the Minnesota Historical Society.

are shelved. The desire to consult films near the shelves will depend somewhat on the type and content of materials placed on film.

In summarizing the practices of a group of libraries, film classification, great variation, ranging from doing nothing to complete performance, is noteworthy. While the classification of films in libraries is generally kept at a minimum, this does not mean that no system of arrangement is employed. It is apparent that some sort of ordered system will be necessary if there is any likelihood that a considerable number of reels will be acquired for the library collection. The possibilities of growth may be shown by the experience of Temple University Library, which, although by no means a large library, added in the academic year, 1938-39, 1,126 titles on film, of which 203 have been cataloged and classified by July, 1939.[11] Temple uses three broad classifications. Those films of books printed in England before 1550 have "Po" (standing for Pollard) prefixed to the call number. This is also the New York Public Library practice. Therefore, if a certain title was the fourth item on the sixth reel of the project the call number would be "Film Po6 #4." The second classification includes all other films not in the above project excepting those of periodicals and newspapers. With these items serial numbering is used. For example, the fourth item of the second reel received by the library would have the call number "Film 2 #4. Periodicals and newspapers fall into the third classification, and "Per" is part of the call number. This has been done because it is felt that the periodical department at some time may have its own film cabinet and reading machine.

Harvard University, the Minnesota Historical Society, the University of Texas, the University of Virginia, Stanford University, the University of Missouri and Princeton University use some sort of simple classification number. Harvard uses letters to signify classes. The Minnesota Historical Society uses a symbol for its genealogical papers, the letter "A" indicating film, and Cutter numbers distinguishing family names. The University of Virginia uses a numerical arrangement which is further subdivided, e.g., "Film P7-26." The others use serial number-

[11] Temple University. Sullivan Memorial Library. *Annual Report of the Catalog Department, 1938-39* (Typewritten; 1939), p.8. The writer expresses his gratitude to Miss Martha Connor, of the Catalog Department of the Temple University Library, for her aid in assembling material regarding the Temple practices.

ng following the word film. The Huntington Library is an exception, and uses symbols, as for example, ENG to denote "English Collection." In addition it includes a classification number on the card in the form of an accession number.

The practices in regard to the cataloging of films, despite the urging of writers towards standardization, show a wide variation. Brown's data regarding the cataloging of films have been worked over and analyzed. Eighteen of the 46 libraries listed have entered their catalog cards into the main catalog, marking them "film." Only six, however, have found it necessary to maintain separate catalogs of their films. The question of separate catalogs for films is an interesting one. If the films are stored in a separate room, where all work connected with them is done, then it seems that a separate catalog would be useful, as would a separate shelf list. However, if films are placed in the stack in a special cabinet, and used essentially as books or other stack material, there appears to be no real reason why a separate catalog should be maintained.

Yale University has a special room for films. If there is a chance of a shift from stack to special room use, then a separate catalog might be made, for it is cheaper to produce an extra catalog at the beginning, especially if mimeograph, dexigraph, printing, multigraph or some other form of reproduction is used.

Of the 46 libraries listed in Brown's survey, 15 have indicated that they have not cataloged their films. More interesting, however, is the fact that only 3 of the 15 reported that they would enter their films in the main catalogs of their libraries at a later date. Of 4 other libraries indicating that they will enter cards in the main catalogs later, 2 at present maintain separate catalogs and 2 are doing nothing in cataloging their films.

Thus, in the cataloging of films, two points should be considered: first, whether or not cataloging should be done at all; and second, if cataloging is done, to what extent fullness of entry should be carried. Metcalf, Gerould,[12] Carruthers and Wright[13] have indicated that the

[12]A. C. Gerould, "Cataloging of Microfilm at Stanford," *Library Journal,* LXII (Sept. 15, 1937), 682-83.

[13]R. H. Carruthers and W. E. Wright, "Library Methods of Handling Microfilm," *A.L.A. Bulletin,* XXXII (June, 1938), 385-87. Also Wright, *op. cit.*

cataloging of films should not differ from the cataloging of books and pamphlets. Metcalf would make an exception in the case of films which are included in bibliographies. He cites, for example, the items included in the *Short-Title Catalogue,* which might be entered very simply in the card catalog, with a reference to the printed bibliography. Within the printed bibliography there may be recorded beside the particular item the number of the film on which it is reproduced. Metcalf would also use short form cataloging for short length films of magazine articles which have been acquired in lieu of interlibrary loans.

How closely have libraries followed suggestions which have been offered in articles? An examination of the sample cards of 12 libraries[14] furnishing data reveals varied patterns of notes and forms that have been used in the cataloging of microfilms. These notes and forms may be listed as follows:

Place and date of microfilming and printing, used as imprint
Number of reels
Type of container
Collation of original
Note that it is a film reproduction
Name of the photographing agency
Location of originals
Owner of originals
Contents of the reels
Nature of the film (positive, negative)
Date microfilm made (as separate note)
Reduction ratio of film
Placement of film (position)
Title on microcopy
Kind of film (e.g., Eastman microfile)
Accession number of film item
Entry in printed bibliography
Amount of material (e.g., 44 boxes)
Number of frames to reel
Pages per frame
Form headings
Manufactured title (for newspapers)

These items are usually added to the ordinary information such as author, title, imprint, collation, and notes used in cataloging. Naturally, no single card contains all or even most of the notes, but such a case is not impossible. Libraries have used the same note in different ways. However, though the above list may appear rather lengthy, there are other items, such as the suitable reading machine, or a detailed history of the original book or manuscript, which have been suggested for inclusion on catalog cards for films.

[14] See footnote 10.

For purposes of discussion, the notes may be conveniently grouped into six categories. These relate to (1) title, (2) imprint, (3) collation, (4) format, (5) bibliographical data, and (6) film data. The manufactured title used by the Boston Public Library for the *Boston Globe* is the only example of a card having the word "film" directly in the title, even though the term is bracketed. It is a device of convenience.

In regard to the imprint, items such as the place and date of the photography and printing, and the name of the photographing agency seem to be more important to the library than to the user of the film. Since it is unnecessary as well as cumbersome to list all the notes on all cards, it might be suggested that these notes be placed on the shelf-list cards, or on another department record, rather than on cards intended for the public catalog.

Collation notes offer more to the user of the catalog. The number of reels, or a note, as 44 boxes, for example, indicates the extent of the material, provided, of course, that each box contains more than short strips. The collation of the originals, in addition to pointing out the paging and size of the copied material, is also of bibliographical interest. As it is often impossible to secure the original collation of material, it will not be possible to give this information in all cases. If given, it may on occasion save the patron the time needed to check for it.

The size or width of the film is usually given as an aid in selecting the type of reading machine which should be used. However, if the library has reading machines which will handle all the sizes of films that it acquires, this seems to be an unnecessary item on the cards; such information might be placed on the container or on the reel if necessary. The noting of the type of container in which the reel is stored seems entirely needless. A person interested in research cares very little whether the film is in a metal, wooden or paper box, or in no box at all.

Information as to whether or not the material is on film seems to be the most important item to include, and should precede all other notes. This item tells the user three important things: (1) that he will refer to a reproduction on film, rather than to the original, (2) that he will require a reading machine if he wishes to take notes, and (3)

that ordinarily the material will have to be consulted within the building. The form headings used by the Boston Public Library seem to be extravagant, especially if a library plans to acquire thousands of titles on film. The shelf list should answer any important questions more advantageously than form headings in the catalog.

The notation of the location and ownership of the originals is primarily intended to give the user information in case he finds it necessary to consult them. This may be necessary if the film copy has been poorly reproduced, in which case the library should get another copy, or because the scholar is anxious to know exactly what copy of a rare edition he is using. In practice, however, it seems that consultation of the originals would only be necessary in a few cases, otherwise why bother with a film copy at all? Scholars working on research projects frequently know the location of extant copies of materials in their special fields. Strictly speaking, then, these data are desirable to describe the book or manuscript completely from a bibliographical viewpoint.

The inclusion of a note relating to the contents of reels appears to be as important as similar notes for sets of books. It is clear that such notes may save wear and tear on films, as well as the user's and attendant's time, if it is known immediately on which reel a desired item is located. To note the bibliography in which an item appears seems useful in cases where the information may be used in lieu of full cataloging, and as a part of the classification scheme. It would be of value, probably, only in such operations as the *Short-Title Catalogue* work. However, such types of cooperative enterprises should be more plentiful in the future.

The notes which relate to the films themselves are interesting and while they may be important, according to the point of view, it might be suggested that unless an educational program for users is instituted, some of these items will not have much significance. Indication as to whether a film is a negative or a positive describes the nature of the film. It is desirable if only from the point of full description. In addition, it suggests to the user the possibility of securing a copy if the film is a negative; it should also suggest that the continued use of the negative will make it difficult to obtain good positives at a later date. Indication of perforations is necessary only in case the choice of a

reading machine is involved. Even here, however, it seems that this bit of information might be placed on the container or on the reel. This, like some of the other points raised, is debatable.

The amount of reduction has been said to be important in order to show which reading machine should be selected. As Metcalf points out, "a projector that enlarges twenty-four times is unsatisfactory with a film that reduces only six times, and one enlarging eight times, will not make legible a film giving sixteen minifications." But just what does that mean to the average user of the library? While this matter is important to the reference assistant, or the person in charge of the reading machines, it does not seem to have much meaning for the user who is unacquainted with photographic terminology, and a term "9 diameters reduction" strikes no responsive chord. It is possible, of course, that in the future users of films will know all terms connected with such materials. It is hoped that they will be better informed than they are at present regarding terms which are used on catalog cards for books.

Along these same lines, the matter of "placement" might be relegated to the reel or reel box, rather than the card in the public catalog, on the ground that a research worker will use the film regardless of position, if a machine is available. Moreover, he would care little whether there is one page to the frame or several. The title on the microcopy, if different from the original title, is perhaps a necessary item. Needless, however, is the description of the kind of film. One would hardly care whether the film is Eastman microfile or some other kind. The accession number on the card, if used for classification purposes, is satisfactory; if not, it should be placed on the shelf-list card.

The actual practices of libraries in cataloging microfilms may now be considered. In cataloging, as in classification, practices have varied. Many large libraries are apparently waiting for the Library of Congress to issue standard rules or for the A.L.A. Catalog Code to include decisions regarding the treatment of films. While Chicago and Columbia universities have waited, the University of Texas has gone into film cataloging with vigor. The completeness of the Texas card [Fig. 1] may be contrasted with the simple Harvard card [Fig. 2]. The Boston Public Library [Fig. 3] has gone to the extreme in providing a large

number of form headings. The approach of two different libraries to the same film is observed in the cataloging of the *Maryland Gazette* by the University of Virginia and the University of Missouri [Fig. 4]. The Virginia card does not contain a note concerning contents of the reels.

The University of Missouri card indicates the need of notes when

FILM
2

BANKS, John fl.1696.
The innocent usurper; or, The death of the Lady Jane Gray. A tragedy. Written by J.B. London, Printed for R. Bentley, at the Post-House, in Russel-Street, in Covent-Garden, 1694.
3p., l., 60p. 23cm.

MICROCOPY: 1938. Original at the University of Chicago. Placement II. 9 diams. reduction. 35-mm double-perforation safety film. Negative.
(continued on next card)

TX 37/8 - 3442 IK

FILM
2

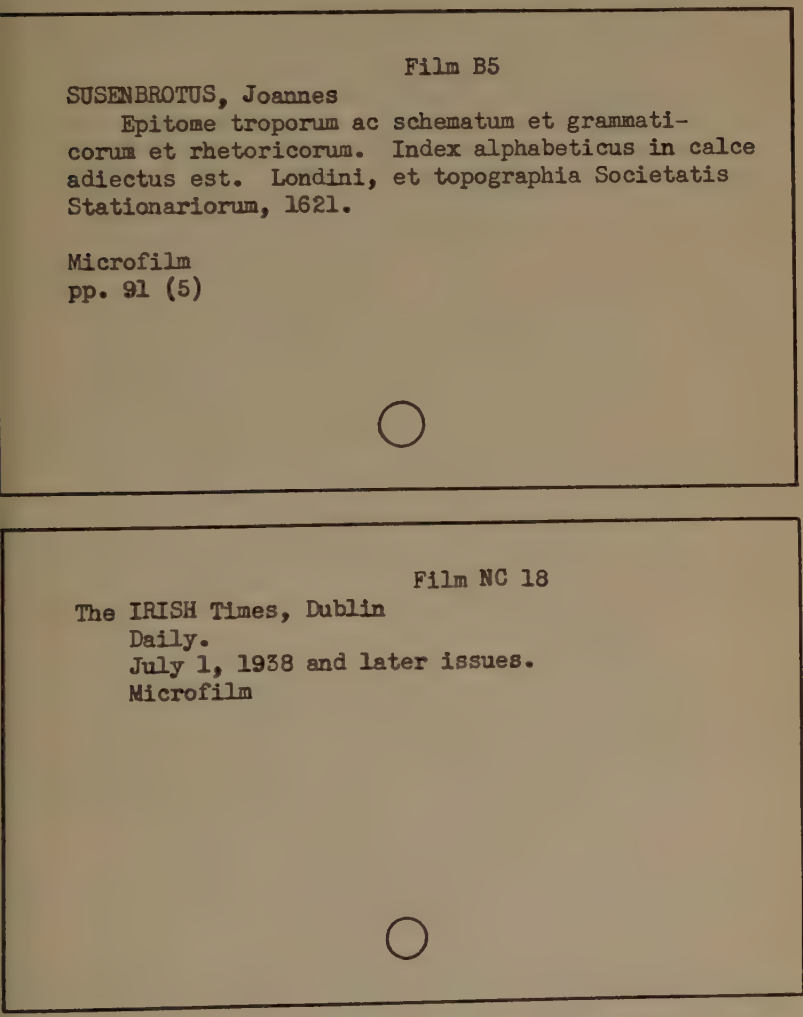
BANKS, John fl.1696. The innocent usurper... 1694. (Card 2)

Dedication signed: J. Banks.
Microcopy has title-frame: John Bankes. The innocent usurper.

1. Dudley, Lady Jane, known as Lady Jane Gray, 1537-1554 - Drama. I. J.B. II. B., J. III. Bankes, John. IV. Title.

FIG. 1.—University of Texas catalog card for microfilm

ilms are made for items included in a bibliography. The practice at Stanford, along with that of several other libraries, is to include the number of frames and pages per frame. Several of the samples investigated indicate that interest in the originals is strong enough to warrant the placement of a note regarding the location or the ownership or both. The practices in connection with such matters as placement



Film B5

SUSENBROTUS, Joannes
Epitome troporum ac schematum et grammaticorum et rhetoricorum. Index alphabeticus in calce adiectus est. Londini, et topographia Societatis Stationariorum, 1621.

Microfilm
pp. 91 (5)

Film NC 18

The IRISH Times, Dublin
Daily.
July 1, 1938 and later issues.
Microfilm

FIG. 2.—Harvard University catalog cards for microfilms

(position), reduction ratio, or the nature of the film (negative or positive) have varied. There is rightfully some question whether or not these notes are necessary on the catalog cards. The cards of the Hall Laboratories are samples of cataloging treatment of periodical articles on microfilm strips. This type of cataloging is apt to be frequent in libraries. Short form cataloging is probably the best practice

Boston Daily Globe.
[Film strips. Positives, Aug.1/15, 1936 - June, 1937. Negatives. Aug. 1/15, 1936 - June, 1937]

— New York. 1936-37. 44 boxes. (Eastman microfile safety film)

Additions on this card only.
Continued on next card

E2860-s.r.-Film strips.-Boston. Newspapers. Films.-Newspapers. English. Facsimiles and reprints. Films.-Eastman Kodak Company. Recordak corporation. Publications.- Photographic reproduction of books, manuscripts, etc.-Microphotographs. Eastman Kodak company. Recordak corporation.

FIG. 3.—Boston Public Library catalog card for newspapers

in regard to these short strips. Mr. Fussler has pointed out that library cataloging can become so detailed that the handling of a strip of film may be much more expensive than the purchase of the original.

In the matter of the mechanical preparation of films for the shelves the following points may be considered; ownership marks, classification marks and storage containers. Mr. Brown in his survey made no effort to find out what methods were employed in affixing ownership or identification marks, or labeling with classification numbers. He did, however, learn how libraries were storing their films, which may be regarded as the final step in the process of handling films from the standpoint of the technical department. Metal containers, pasteboard boxes, wooden and steel cabinets, a vault or safe are some of the containers used for storage. Probably the majority of the libraries is using pasteboard boxes. Brown also discovered that most libraries were not

using any special humidification; a few employed moist sponges or closed cabinets with special humidifying apparatus. Building and room humidification have proven satisfactory in several instances.

UNIVERSITY OF VIRGINIA

Film P7-26 Maryland Gazette Annapolis, Md. 1745-1820.
Weekly. Estab. 17 Jan. 1745, by Jonas Green, under the title of The Maryland Gazette. With the issue of Oct. 26, 1789, Wm. Rind was admitted to partnership. The paper was continued by Jonas Green until after 1820.

Film reproduction.
In 20 reels, microphotographed by Yale University Library.

UNIVERSITY OF MISSOURI

Film 1 The Maryland Gazette, Jan. 17, 1745 - Dec.28, 1820.
Annapolis, 1745-1820.

20 reels, 35-mm.

One page per frame.
"Microphotographed from the originals in the Maryland State Library (Annapolis) by Yale University Library, 1938."

Positive film.
Contents:—
reel 1.-1745-48.
reel 2.-1749-52.

FIG. 4.—Comparison of the cataloging of the Maryland Gazette by the University of Virginia and by the University of Missouri

Some librarians may argue that the mark of ownership on a film is probably as necessary as a mark of ownership on a book. The expense of a film is often nil when compared with the cost of the original, but in itself the film might have been rather expensive to reproduce. Hence, there seems to be some reason for placing a mark, secret or apparent, on the films. Obvious methods of marking ownership are those used in the treatment of books, e.g., perforating, or marking with ink. In the case of films, it is useless to perforate a frame. A blank frame, just as a blank page in a book, may be easily removed. While it is not particularly harmful, except in cases of rare books, to stamp the page of a book, it is evident that even a small-sized perforating stamp might punch out words or letters on a film. However, if a tiny stamp, after the fashion of moving picture censor board stamps, was devised, it might be used. A symbol, instead of a word, may be used for marking. In the use of ink, experience has shown that black ink permeates the emulsion and is more resistant to removal than white ink.

On the whole matter of stealing films, which ownership marks may tend to prevent or minimize, it may be generally observed that there is apt to be less theft here than in the case of books. Ordinarily, films, which are not usable without reading machines, should not be as salable as books. Moreover, there is more supervision of the use of films than of books. Finally, films generally are not open reference materials. However, in the matter of clarifying ownership in the case of interlibrary loan mix-ups, marking has more significance. It may be necessary for this reason to introduce some form of noting ownership.

It also has been found desirable to photograph at the beginning and end of each film a strip giving information concerning the author, title, date, place of publication, location of material and reduction ratio. These data should be of such size that full indentification of the film will be possible without actually having to place it in the reading machine. No evidence as to the prevalence of this practice could be gleaned from Brown's data. It is regularly carried on by the microphotographic laboratories of Chicago and Temple universities, however. The actual marking of the classification number (and accession number, if one is given) may be done with black India ink on a piece of leader film, and on the reel and box.

Before closing this statement regarding the mechanical handling of films, mention should be made of the New York Public Library procedure of batching strip material on reels in rough subject groups, a procedure which is similar to the treatment of pamphlets in that institution. While this results in ease in handling, it ties up many important items when a single one is in use. Moreover, it is apt to increase wear and tear if a much used item is near the end of the reel.

Color Slides for Art Teaching

ROBERT P. GRIFFING, JR. and DONALD N. WILBE

THE FIRST essential in the teaching of the history of art and architec ture is plentiful and accurate visual material. When the subject of ar is presented in so many ways in hundreds of institutions, ranging fron the elementary grades where children are told about a Raphae Madonna, without being shown a reproduction, to the great univer sities with collections of 50,000 lantern slides and as many thousand of photographs and prints, the problem of securing adequate visua material is one of extreme complexity. It must be conceded that blac and white visual material is already out of hand, for the field is so larg and has developed in such a haphazard manner that there is no longe any possibility of forming new organizations to supply such materia Color material is, however, another matter, for while good color prin reproductions have been on the market for several years, the possibilit of producing slides of high accuracy by direct color photography is relatively new one and represents a field which may be developed alon serious and scholarly lines before it grows too large to be controlle

Color Slides Cooperative hopes to develop the potentialities of direc color reproduction in a definite field. The initial organization was th outgrowth of conversations between Henry M. Willard and Donal N. Wilber, and its affairs have been directed in most part by Robe P. Griffing, Jr., with the recent association of Mr. Wilber. The projec is supported by institutions teaching art history. Running expenses ar met by a membership fee of $5, and the list of members already include some 60 colleges, universities and museums. It serves as a clearinghous for information about new developments in color photography, we comes queries and information from any sources, and issues a mimeo graphed bulletin describing current activities and proposals for future program.

The first year's activity centered around two major questions: first, would educational institutions show enthusiasm and lend active support to a proposal of this nature; and second, was color photography technically perfected so that art objects could be recorded with true fidelity. The first of these questions was answered when, aided by a grant from the Carnegie Corporation, Mr. R. P. Griffing attended the annual meeting of the National Association of Museum Directors during the summer of 1939, and found that his outline of the project met with almost universal approval. Subsequently, he visited a number of museums, discussed the nature of the project and at the same time noted the amount of color work done by the different institutions. The results of this trip, the presentation of the plan to the annual meeting of the College Art Association and the answers to letters sent directly to individuals demonstrated that the need for such a project had already been felt and that it would find support throughout the country.

The qualitative rating of color reproductions could not be determined by a hasty investigation. Accordingly, a period of several months was spent in examining color transparencies and obtaining from photographers their appraisals of the properties of the films. Most of the commercial work done in the field was for advertising purposes where emphasis has been placed upon achieving pictures of great brilliance and with high contrasts of colors rather than arriving at the exact color relationships of the original subject. Since this problem was so important and material of a comparative nature rather difficult to find, it was decided to bring together a number of scientists directly concerned with the general question. A symposium on Techniques in Color Photography was held at the Metropolitan Museum of Art, in New York, on November 10. More than 60 people attended the morning and afternoon sessions. A résumé of some of the material presented and discussed should be of general interest.

The principal speaker of the morning session was Joseph Lyons, photographer of the Frick Collection in New York. This museum has been very active in its efforts to record its collection in color transparencies. Mr. Lyons emphasized a point of major importance which is not yet part of common knowledge, that color photography cannot be satisfactorily done by rule of thumb or by using experimental

methods developed by the individual photographer, but that the laboratory directions supplied with the color film must be followed literally and every step in the work must be carefully controlled. An exposure meter must be used; artificial lights should have a temperature of 3,200 Kelvin units, and this temperature should be frequently checked with a color temperature meter; the nature of the film demands relatively short exposures with wide lens openings. Mr. Lyons demonstrated about 20 transparencies made from paintings in the Frick Collection. These were the object of considerable discussion. It was generally agreed that, because of variation in color and tonal relationships resulting from a difference in exposure of much less than a single stop of the lens, three exposures should be made of each object in order to insure one perfect negative. It was conceded that certain subjects such as paintings having strong highlights and masses of deep shadow are hard to record and that the color film has limitations in such fields.

A discussion of the relative and absolute color accuracy of the film brought up questions concerning the projection of the transparency upon a screen; color slides can be used to full advantage only in projectors of the most modern type in which the light source, stronger than generally required for black and white slides, is properly concentrated through color-corrected lenses and with bulbs in which the filament has a color temperature corresponding to that of the lighting used when the transparency was exposed. The stability of color film during the period of projection was questioned, and Dr. Staehle, of the Eastman Research Laboratories, said that the film could be left in the new type projectors for several hours without serious fading. He pointed out that as the intensity of the light is increased, for example in projectors of long throw, adequate provision must be made to cool the slide with a current of air, and heat-absorbing glass must be used in the optical system. Declaring that the stability of the dyes now used on the Kodachrome film was much greater than that of those previously employed, he said that for maximum life the film should be kept as dry and cool as possible. It was suggested by one of the photographers present that processes for mechanical and chemical dehydration of the film which would ensure its longevity were available, but those present were not familiar enough with the techniques mentioned to reach any

conclusion. There was some discussion of the comparative qualities of the 35mm. versus the larger sizes of Kodachrome, and Dr. Staehle stated that their components, which were formerly quite different, were being changed, and the emulsions were now quite similar.

Dr. Henry C. Staehle, of the Research Laboratories of the Eastman Kodak Company at Rochester, was the principal speaker at the afternoon session. He had brought with him an extensive display of Kodak equipment especially suitable for museum photography with Kodachrome film. Designed for quantity production of the 35mm. slides is the new Microfile Recordak camera. With this camera a beam of light, covering exactly the area which will subsequently be photographed, is projected directly onto the subject. The exposure is then made by turning on the required lighting units and pressing a button which starts the camera in operation. As long as the button is held down, the camera operates, taking approximately 75 pictures a minute. The camera is similar to that supplied for library use in copying books, manuscripts, etc.

Dr. Staehle related his talk to the problems of the color slide project by stating that the success of such a scheme depended upon making available slides of works of art at a relatively low cost so that every school could afford to build up a good-sized collection. In some respects the 3¼ by 4-inch film is definitely superior to the 35mm. size, but the lower cost of the latter is an important economic factor. He stated that in the smaller film the color contrast is somewhat lower than in the larger sizes. The relatively strong contrast between the different colors of Kodachrome, which gives a noticeably heightened three dimensionality to the projected image on the screen, has been established to meet the demands of the commercial photographers who are its largest users. For the type of work done in museums the contrast of the film can be lowered and more light brought into the shadows by "flashing" the film. Flashing is done by exposing Kodachrome uniformly to white light either before or after exposure in the camera. One method is as follows: Set up the object and have the camera in proper position for the exposure with the lights turned on. Then hold a white card in front of the object (the card to be large enough to cover the field of the lens) and give a very short exposure. If the exposure for the object

has been calculated to be one second at f 8, for example, then the flashing time should be 1/50th or 1/100th of a second at f 8. Then the desired exposure of the object should be made following normal procedure.

A number of Kodachrome slides of a single subject may be produced either directly, i.e., by making as many exposures as the required number of slides, a system for which the Recordak would be especially useful in the 35mm. size, or by duplication from a master film. At the present time, unless 50 or more copies are to be made, the cost of duplication makes the direct exposure process the more economical one. The Kodak Company is preparing a booklet covering all the phases of copying technique which will be published in the near future.

Dr. Staehle discussed some of the questions of the morning session and demonstrated the importance of exposure control, color temperature control and the fact that the projected Kodachrome image may differ considerably in appearance from the painting from which it was made simply because the illumination of the slide in the projector is bound to be quite different from the gallery illumination of the picture. His demonstration was carried out with an oil painting illuminated by a beam of light from a projector. Alongside the painting was a screen on which transparencies of the painting at its exact size could be shown two at a time. The various transparencies, compared with the painting, illustrated variations resulting from different exposures and color temperatures. Color-compensating filters of very pale yellow-orange or blue tones were used in front of the projector beam in order to correlate the color temperature of the illumination of both the painting and the color transparencies.

In this connection Dr. Staehle demonstrated the new Eastman Color Temperature Meter used to determine the quality of the light used in color photography. He stated that the Kodachrome Professional Film Type B, is balanced for a color temperature of 3,200 degrees Kelvin which is best produced by the General Electric 3,200-degree Kelvin lamps which are available in different wattages and which should be used in reflectors which do not alter the color quality of the light. Type A Kodachrome for miniature cameras is balanced for a color temperature of 3,450 degrees Kelvin, i.e. for Photoflood lamps. The longer-lived

3,200-degree General Electric lights may be made equal to 3,450 degrees by using color compensating filters in front of the camera lens.

In the closing hour of the symposium, six museum photographers demonstrated their color slides, described the conditions under which they were made and gave their evaluations of the results obtained.

The most apparent lesson of the symposium was that the production of color slide transparencies of a high standard of accuracy is still in the experimental stages. This situation is the result of the fact that only a few people are working in this field and that the scientific controls which form the basis of such work have only recently been formulated and have not yet been widely disseminated. A number of other points brought up at the symposium which are of a less general nature will be the object of investigation by Color Slides Cooperative. One of these concerns a more scientific and accurate method of making a direct comparison between the original object and the color transparency made from it. A second concerns the suitability of various types of projectors for showing color images and the possibility of adapting existing types of projectors to maintain similar standards among the users of color slides. Another has to do with the balance of color contrast, for the strong contrast of Kodachrome is a definite problem. Most of the slides demonstrated and information received have been about Kodachrome, but the project hopes to obtain more complete data on other color film both from the manufacturers and from those who have used it. Another problem concerns the limitations of color film; contrary to expectations none of the photographers at the symposium said that the film in use would not accurately reproduce the entire color scale, but it was felt that certain types of subject were less satisfactorily rendered, and it is proposed to define these subjects. The investigation of these problems will be conducted during the coming months and plans are being made to hold a sceond symposium in the spring of 1940 at which attention will be centered on progress made both on the solution of these problems and on the general evolution of a more scientific approach to the various steps in the production of a perfect color transparency.

Meanwhile Color Slides Cooperative is making plans for beginning operations on a fairly large scale. If support from a philanthropic

foundation is forthcoming, the project will set up an office early in 1940 and issue sets of color slides. The transparencies will be made directly from art objects in museums and collections in this country. Master transparencies will be approved or rejected by curators in the museums and by a committee of art historians before they are rephotographed in quantity from the original objects and issued in sets to the member institutions. Several sets of approximately 100 slides each will be sent out each year and will be available in both 35mm. and 3¼ by 4-inch sizes at the option of the members. The first series will create a general survey of the history of art covering all periods and all mediums and these earlier series will then be expanded to include sets concentrating on limited fields. Assurances of cooperation have already been received from a number of museums, interest in the project is running high and the chances that such a program may soon be in effective operation seem very good.

Microphotography in Columbia University Library School

A COLLABORATION*

LAST SUMMER'S course, Microphotography for Libraries, was intended to equip librarians to install and operate or supervise a microfilm service. The making of film as well as the handling of it for the use of readers occupied a large part of the waking thoughts of the students, especially those who were in the laboratory sections. There were two groups of students, those who attended only the daily lectures and those who also worked for three hours, two days a week in the laboratory. So popular did the laboratory become that the set hours proved to be not so much the time when one section met as the time when the other section was excluded from the laboratory. Early and late students flocked in to ask questions and work out problems.

There were five cameras available for student use, two Argus Technischopes, two Leicas and a Photorecord. Two darkrooms were at their disposal. The number of laboratory students was dictated by these physical conditions, being limited at first to 10 and then reduced to 8 working in each section. This allowed groups of two a camera apiece and a darkroom shared with but one other group. Students were accepted in the laboratory sections chiefly on the basis of the extent of their future responsibility for the microphotographic service of their libraries. Several of them had already been making microfilm in their libraries and many more are now doing so.

All students were given an opportunity to visit the laboratories and to make use of reading machines. Two Argus Readers were chiefly utilized for student practice, with a Recordak at hand. Suggestions were made as to visits to other laboratories within easy reach, and several students made very good use of weekends devoted to microphotographic visiting.

* By Mary A. Bennett, Dorothy H. Litchfield and Agnes Townsend.

The course was roughly divided into three parts: a technical consideration of the fundamentals of photography, the application of these to microcopying and the acquisition, care and use of microfilm in the library.

In the development of the technical part of this course there were two main objectives; first, to teach the basic principles of photography in such a way that the students would be able to use them in the solution of any copying problems met in the future; and second, to present sufficient variation and practice in the laboratory work to familiarize the students with the equipment necessary for handling most microphotographic work.

Since good photography was the ultimate aim, the discussion opened with an explanation and demonstration of the steps necessary to the production of a perfect negative. The camera with its optical equipment, the lighting, the film and its holder, and finally the developing, fixing and washing needed for the production of a permanent image were thus introduced as the fundamentals which were to be discussed in detail during the progress of the course. Here the care and cleanliness with which darkroom work should be carried on were particularly emphasized.

The essential parts of a good camera were studied next. A discussion of object and image relationships together with magnification or reduction ratios used in microcopying served to show the function of the camera lens; while a study of the depth of field of a lens, as well as the aberrations of the image formed by the lens of one of the less expensive cameras indicated the need for and the use of the lens diaphragm. In addition tables of values were presented showing the maximum thickness of book-page material which could be copied with one focusing of the lens and still give on the film a resolution high enough for easy reading of the microfilms.

While optical questions were being considered, the essentials and characteristics of several reading machines were discussed. Magnifying powers necessary for comfortable or easy reading, distortions of the projected image, and illumination of the reading screen were some of the points taken up.

Light-sensitive emulsions were considered next. The exposure, den-

sity and development characteristics of various films used for microcopying were discussed. In this connection different developing solutions were mixed and used by the laboratory students in order to familiarize them with the ingredients and process involved in compounding a good developer. At this point, too, the advantages of time-temperature methods of developing films and paper prints were thoroughly discussed, and the laboratory students demonstrated experimentally that the contrast of their films could be changed considerably by altering the time of development. The spectral characteristics of films together with the reasons for using non-color-sensitive film for one problem and panchromatic film for another were described and demonstrated. Those who worked in the laboratory experimented with various filters and determined which one was best suited for removing a stain from some material to be copied.

From time to time during the technical part of the course specific problems in microfilming were discussed, but since all problems could not be taken up in such a short time, and indeed many which will present themselves to these students could not even be foreseen, it was thought that the greatest benefit would come from a thorough discussion of the fundamental principles involved. It was these principles which this part of this course stressed.

With a consideration of the place of microphotography among the many methods of documentary reproduction, the transition was made from the general principles of photography to their application to the filming of books and manuscripts. The fact that microphotography is but one of many methods is too often unrecognized. The low cost of the method appeals to people who have very hazy notions of its real nature. It must be emphasized that for many purposes microfilm is not appropriate. In a course of this kind it is extremely important that students who will be trained in only one process understand where its greatest usefulness lies and where it stands in relation to other allied processes. Intelligent microphotographic service depends upon a realization of the possibilities of each process.

After this introductory antidote to overenthusiasm, attention was centered on available equipment for microcopying. Primary emphasis was, of course, placed upon 35mm. cameras, 16mm. equipment and its

uses being described briefly. Each type of 35mm. camera was described in detail and all but the most complex were demonstrated before the class. An understanding of first principles being essential, the simplest cameras proved best for purposes of demonstration and of practice. Emphasis was placed on the simpler cameras because they leave all the responsibility to the photographer. He must learn to think of lighting, focusing, diaphragm adjustment and timing for himself. If he should afterward be fortunate enough to have an automatic camera, he will understand it better for having learned to depend on his own ingenuity in the beginning. A camera and tripod served the purpose of showing the students how much can be done with a minimum of equipment. The cameras used by the students in the laboratory were demonstrated in detail. A class hour on each was spent in discussion and demonstration of the Argus Techniscope, the Leica and its copying attachments, and the Photorecord. The larger, more mechanized cameras were discussed and illustrated by means of slides.

The available films suitable for copying various types of material were considered as well as the effects to be achieved on them by the use of various filters. The processing of short films and of longer ones presented separate problems calling for specialized equipment. The class was made familiar with small developing tanks, the Stineman system, and rack and tank system, all by sight, and the laboratory sections by experience.

Once the negative was made, it could be used in many ways, each worthy of consideration. These uses were pointed out and the possibility and limitations of a complete photographic reproduction service made clear. Film positives are very simply made, lantern slides on film or glass are but another step, and ordinary enlargements will in many cases serve the purpose of rotographs.

For the most part, the end of the process will be the negative itself. Those who have seen films made in a variety of laboratories know that there is great need of standardization in the format and identification of microfilm. Pending a more authoritative decision on these points, suggestions were made as to placement, the inclusion of adequate leaders, the winding of the finished film, and identification as to title, owner and size of the original, filming agency and date of filming.

No problem, perhaps, aroused as much class interest and discussion as the planning of the library laboratory and its administration. Its location and equipment were considered ideally, and as adapted to existing circumstances in several institutions.

Costs and charges in microphotography are by no means settled matters, but will vary with place, equipment and staff. Only the principal factors which influence them could be indicated. The question of ethical duplication of materials belonging to others at either first- or second-hand and the allied problem of copyright formed the basis of an experience meeting of considerable interest.

The last weeks of the summer were devoted to microfilm in the library from the point of view of the librarian who is responsible for its acquisition, care and use. His criteria for a film strip are not necessarily identical with those of the technician who makes it although the two should come to an agreement as to what a good film is. Criteria were suggested in respect to definition, contrast, reduction, placement and alignment, page sequence and identification. These are matters of great importance to the reader, but are too often neglected by the technician as has already been said. This was not repetition of what has gone before but a presentation of the subject from the other side.

Problems involved in the use of reading machines were raised and equipment used in their solution demonstrated. Film splicers, rewinders, and film cleaning fluids and devices were recommended as accessories.

Ideal storage conditions and equipment for securing them were discussed, as well as the relative merits of types of film containers, reels and storage cabinets now on the market.

The history of the cataloging and classification of film was briefly reviewed and the present practice in the students' libraries and others formed the basis of discussion.

There were several lectures on the problems to be met in acquiring microfilm from various libraries of the world. As there is nothing remotely resembling standardization of practice, especially in European libraries, we could only relate the varying regulations and rates which prevail in some of the universities, research libraries, historical societies, museums and monasteries of the world. These lectures were supplemented by references to the more important union catalogs of incu-

nabula and manuscripts, with emphasis on the professional obligation of libraries to give an accurate and correct citation of whatever item is to be filmed.

In the brief six weeks of a summer session there was time for little more than a survey of the microphotographic field in the lectures, and in the laboratory a little practice in solving a few of the simplest problems. However, a start was made. The students returned to their libraries, knowing what the problems were and how to go about solving them. The rest experience will teach them.

Sheet Microfilm

RALPH D. BENNETT

AN INVESTIGATION has been made to answer the question whether the advantages of sheet microfilm for scholarly purposes are great enough to make it worth while to give this medium a substantial trial. The investigator chosen had no previous experience with microfilm and no particular interest in the advancement of any one form over the others. A rather complete survey of the whole microfilm field as it exists at present was necessary, and this survey is summarized in the report.

The writer concludes that sheet microfilm for scholarly purposes has enough advantages over the ribbon type to make it worthy of support to the extent of a fair trial. The advantages found are:

1. A natural convenient sectionalization of the material
2. A system of filing which makes every unit immediatly accessible
3. A means of identification which is integral with each unit and can be read without optical aid
4. A medium more adaptable to handling and processing in small units than ribbon film
5. The possibility of an inexpensive reading machine of limited scope and use

It is not expected that these advantages can be had without a small increase in cost over that of the ribbon type.

Under present conditions it is not likely that sheet microfilm will receive any very extensive trial by commercial agencies. The ribbon type of microfilm is well established in commercial applications and seems to be adequate. The advantages of the sheet form are greatest in scholarly uses, but the consumption of film in these uses is an extremely small fraction of the total. Therefore commercial developments aimed toward introducing the sheet form are at present hardly justified.

The costs of sheet microfilm may be expected to be somewhat higher than that of ribbon microfilm. The film cost, though a small fraction of the total cost of finished microfilm, will be somewhat higher for the sheet form. The manufacture of sheets requires an additional cutting operation and more handling in packing than does the ribbon type.

New equipment must be developed for the production of sheet microfilm, and the first item is a camera capable of placing microfilm images in a two-dimensional array on sheets. No camera exists which was designed especially for this purpose, though there are portrait cameras in use which embody the necessary mechanism. Further investigation is necessary to determine whether it is more desirable to adapt the existing cameras or to evolve an entirely new design. A second simple and inexpensive camera will be necessary for applying the indexing information to the sheets.

Sheet film seems to the author to be better adapted to processing in small quantities than is ribbon film. If it becomes necessary to produce sheet microfilm in large quantities, processing equipment is already available for the purpose. For short-run work, printing of positive sheet microfilm will probably be easier than is the case with ribbon film. Where long runs are involved the reverse is true. Labor and overhead charges on sheet microfilm will probably not be much different from those on ribbon microfilm.

A program is proposed for giving sheet microfilm a trial. A trial size sheet 3 by 5 inches carrying 100 book pages with 30 to 1 reduction is suggested. Four ways which might be employed for the introduction of the use of such sheets after the necessary cameras and reading machine have been developed are:

1. The extracting of papers from periodicals or sections of books
2. The reprinting of existing periodical series
3. The reprinting of ancient or out-of-print books and documents
4. The publication of a current periodical

The author points out a number of needs for fundamental research and technical development in the field of microfilm. The first of these needs is the development of standards: in particular objective methods for measuring the resolving power of emulsions, for rating lens quality

in cameras, for rating the performance of reading machines, and for rating sheet microfilm, giving an index of legibility. There is evidence for a need of a better exposure control. The development of emulsions with finer grain would permit applications not possible at present. The possibility of developing a binocular microscope using molded mirrors is mentioned. The rather common opinion that high reduction can be obtained more satisfactorily in two stages than in one should be tested. Methods are suggested for carrying out some of these studies.

NEWS and TECHNICAL NOTES

Adhesive for Preparing Materials for Photographic Reproduction

For certain applications, notably accurate mapping work, base maps are frequently prepared on thin sheets of aluminum, and the names of rivers, towns, etc., are printed on thin sheets of tissue paper which are fastened in position on the map with an adhesive. It is very important that the tissue paper slips do not become wrinkled, discolored or loose. Dr. F. L. Schmehl, of Washington, D.C., has developed the following formula which is applied to the tissue or other medium with a brush.

Flexo Wax C Light	40g
Turpentine	57cc

Melt the wax in a porcelain dish and add the turpentine slowly, mixing the whole thoroughly. Bottle the adhesive which will solidify and form a tacky wax. To use, remelt and apply with a brush.

Flexo Wax C Light may be secured from the Glyco Products Co., Inc., 148 Lafayette St., New York, N.Y.

Advisory Subcommittee to the Committee on Scientific Aids to Learning

Dr. Irvin Stewart, Chairman of the Committee on Scientific Aids to Learning, has announced the appointment of a special advisory subcommittee composed of Mr. Keyes D. Metcalf, Director, Harvard University Library (Chairman), Dr. Ernest H. Huntress, Professor of Organic Chemistry, Massachusetts Institute of Technology, and Mr. Vernon D. Tate, The National Archives. Dr. Ralph D. Bennett, Professor of Electrical Engineering, Massachusetts Institute of Technology, is associated with the subcommittee in the capacity of consultant.

The subcommittee was organized to study the report recently compiled by Professor Bennett on sheet microfilm. It has also undertaken to develop a simplified reading machine for the individual scholar or scientist which can be distributed for about $25. Three pilot models have been constructed to date and plans for the manufacture of a number of these machines are being considered. The simplified reading machines are not intended to compete with any present commercial model, and many features have been eliminated. It is understood, however, that the design now being studied provides approximately 14 diameters magnification on an opaque shielded screen. A

low-cost projection-type bulb is used to deliver approximately eight foot candles of light on the reading screen. Further information is not available, but it is expected that in a subsequent number of the JOURNAL an announcement of the availability of the machine may be made.

Agreement on the Use of Manuscript Material

The Library of Congress and the University of Chicago have recently entered into an agreement regarding the use of each other's manuscript material both in the original and on microfilm. The agreement is as follows: "The Library of Congress and the University of Chicago are glad to facilitate the work of qualified scholars by providing access to such of their manuscripts and other source materials as are open to consultation or to facilitate the use of them through copies photographic or otherwise, the library ownership retaining the right to pass upon any proposal of publication or of further reproduction."

Barron's Weekly Available on Microfilm

Barron's Weekly has recently announced that its current and past files will be made available on microfilm. The past file beginning with the first issue, May 7, 1921, and ending with that of December 31, 1939, may now be secured on 35mm. positive acetate film at a cost of $235. The current file will be filmed twice a year, and the annual subscription price will be approximately $11.85. The present issues average 20 pages in length but there is some variation which will be reflected in the current price. The annual figure, however, is estimated to be within 10 per cent plus or minus of the cost.

The work is being done by the Graphic Service Corporation, 663 Beacon St., Boston, Mass., and complete information may be secured from this firm or from the publishers, Barron's, 44 Broad St., New York, N.Y.

Catalogue of Books Available on Microfilm

Southwestern Microfilms, Inc., 709 Santa Fe Bldg., Dallas, Texas, has just issued Catalogue A, *Early Western Americana Plains and Rocky Mountains* which contains approximately 370 titles of Western Americana on microfilm. Selection was based on the Wagner-Camp bibliography. All titles have been filmed at 12 diameters reduction or less, and with a few exceptions at two pages to the exposure in placement II (with the text running parallel to the length of the film). Maps have been filmed entire or in sections. Positive copies are priced on the basis of exposures as follows: First 100 exposures, 1 cent each; next 200 ex-

posures, 1½ cents each; all over 300 exposures, 1 cent each. Minimum charge is 25 cents per item. Multiple volume sets are figured as one unit.

Southwestern Microfilms hopes eventually to make additional early works on the West and Southwest available on film. Complete details and copies of Catalogue A may be secured from the address above.

Errata and Corrigenda in Microfilming

Dr. J. N. Goldsmith, in a paper entitled "Errata and Corrigenda" delivered before the 16th Annual Conference of the Association of Special Libraries and Information Bureaux, has called attention to a very important factor in filming books and periodicals, notably the inclusion of errata sheets and lists. He points out that in many periodicals errata notes frequently appear in later volumes. More frequently than not these are not included in a microfilm copy. Even in books, many errors are not corrected before the book is released, and errata sheets are sometimes tipped in and lost. Several remedies are suggested, including the keeping of an errata book wherein all such corrections may be entered, and the annotation of the volume, in ink, by the librarian. All technicians engaged in the microfilming of periodicals would be well advised, in the interests of completeness, to check for possible errata when filming complete volumes or periodicals.

Excerpt from an Address by the Librarian of Congress

The following excerpt from the remarks of Mr. Archibald MacLeish, The Librarian of Congress, on the occasion of the laying of the cornerstone of The Franklin D. Roosevelt Library at Hyde Park, N.Y., November 19, 1939, was selected as indicative of the progressive attitude of the National Library toward present-day problems in the conservation and dissemination of knowledge. It is as follows: "There may have been a time when the deposit of essential materials in one library rather than another was a tragic loss. But if there was such a time it was a time which has long since ended. Modern practices of inter-library loan, and modern techniques of photo-duplication can make the treasures of any American library available to the scholars at work in any other."

Filming the Chicago Daily News

The University of Missouri wishes to instigate a project to place the files of the *Chicago Daily News,* from about 1900 or 1910 to date, on film. In order that the cost for positives will not be prohibitive, the cooperation of a number of institutions or individuals is essential. To

date, three institutions are interested, and if a few more can be found, the project will be undertaken. Any institution desiring a file of the *Chicago Daily News* is urged to communicate with Mr. B. E. Powell, Librarian, University of Missouri, Columbia, Mo., at as early a date as possible.

Fullertone Photocopy Machines

Fullerton, Inc., of St. Paul, Minn., has recently announced three new photocopying machines. One of these is a stationary model and the other two are completely portable. The machines are of conventional general design, but incorporate several novel features.

The portable machines are composed of three units which are hinged together. One unit contains the copy-holder, the second the camera mechanism and holder for sensitive material, and the third the developing and fixing equipment. The smaller portable machine holds a 200-foot roll of sensitized paper 7 inches wide, while the larger holds the same length of 9-inch paper. Both machines are built on similar plans; the smaller weighs about 90 pounds, while the larger weighs about 100 pounds. Variation in size of reproduction is possible. Any desired size from half-copy size to double size

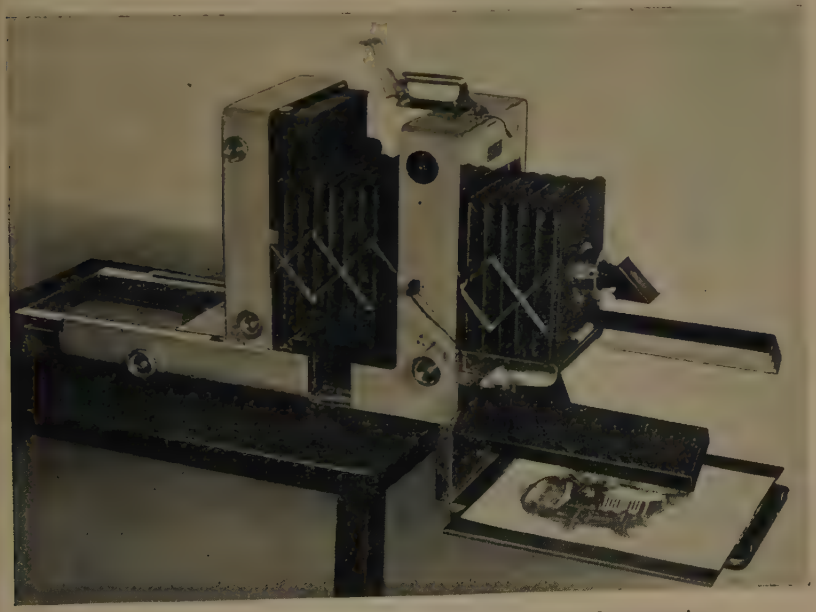


Fig. 1.— Portable Photocopy Machine open, ready for operation

may be reproduced in the machine. An automatic timer is synchronized to control the lights. After exposure an automatic severing device cuts off the paper and places it in the developing tray, after which it is projected into the fixing bath. The Fullertone is said to be the only portable documentary reproduction machine providing adjustable focus and carrying

FIG. 2.—Portable Photocopy Machine

its own chemical solutions which need not be drained in transit. The portable machines are self-contained units and are provided with carrying handles.

The stationary model accommodates 350 feet of sensitized paper 18 inches wide. It is similar to the portable machines except that certain collapsible features are not included. It is mounted on a fixed cabinet which contains the washing equipment and also provides space for the storage of supplies. The copyholder of the stationary model is so constructed that it may be used for the making of small offset plates similar to those used in the Multilith process. The copyholder may also be used for reflex copying or blueprinting.

Prices and complete information may be obtained from Fullerton, Inc., First National Bank Bldg., Saint Paul, Minn., or from McIntosh & Sheridan, 1206 18th St., N.W., Washington, D.C.

GRADUATE THESIS PUBLICATION, UNIVERSITY OF OREGON

Through a Works Progress Administration project, the University of Oregon and Oregon State College have made available in mimeograph form theses prepared by graduate students. As the project furnished the labor, the charges are nominal and cover only cost of materials and binding. All theses are typed single spaced in elite type, and are mimeographed on sheets 8½ x 11 inches. They are uniformly bound in heavy gray cover paper. Two series are available: the University of Oregon Thesis Series with 10 titles ranging in price from 15 cents for a study 19 pages in length to 50 cents for one of 106 pages; and the Oregon State College Thesis Series containing 6 titles similarly priced. Prices are net,

postpaid, and the series are not available for exchange. A list of titles may be obtained from the Mailing Department, Oregon State System of Higher Education, Eugene, Ore.

Micro-Drawing Reader

The Micro-Drawing Reader was originally conceived to meet the problem of storing engineering drawings and blueprints on naval vessels. Since the principles of the Micro-News Reader design were considered acceptable, an order for a Micro-Drawing Reader was given the Graphic Service Corporation by the United States.

The Micro-Drawing Reader has overall dimensions of 24 inches in depth, 25¾ inches in height, and 22½ inches in width. The projection screen is 20 x 13½ inches. The type of mechanism used in this machine is similar to that in the Micro-News Reader (see *Journal of Documentary Reproduction*, II, (June, 1939), p.136-37). Like the Micro-News Reader, the Micro-Drawing Reader has variable magnification and light control in order to project any size drawing to workable proportions. A rear projection screen, similar in principle to the one used in the Micro-News Reader, is free from hot spots and gives an evenly illuminated surface.

An integral part of this machine is a printing frame. By the use of this frame, which is always housed in the mechanism, a direct photographic print may be made from the projected image. The printing frame does not interfere with the projected image when not in use. Folding back the hinged projection screen exposes a glass plate over which tracing paper may be placed. This permits drawing or tracing all or any part of the projected image, easily and conveniently, when a photographic print is not desired.

A film storage compartment, 4½ x 4½ x 22½ inches, is provided in the front of the machine. This compartment has a storage capacity of 14 rolls of film, each 100 to 125 feet in length, or more than 10,000 drawings or blueprints.

Uses for the machine will be found in machine manufacturing plants, architect's offices, industrial concerns, and all types of business where drawings which have to be referred to occasionally or frequently must be stored.

Aside from the space-saving advantages, this Reader allows the making of duplicate copies of originals from microfilm at a minimum cost. The storage of these copies or the original films in vaults apart from the actual place of business, insures against loss through destruction.

Microfilm Abstracts, Volume II, Number 1

The second volume of *Microfilm Abstracts* (described in the JOUR-

NAL, II (March, 1939, p.26-28) has just appeared. It contains a cumulative index of theses available from University Microfilms with a notation of the page length of each. Positive microfilms are available at 1¼ cents per page, and for the benefit of those not having access to reading equipment, paper prints 6 x 8 inches in size will be furnished at a cost of 6 cents per page.

Microfilm Department, University of Wisconsin

The Microfilm Department of the University of Wisconsin offers its facilities to faculty members of this and other educational institutions, to students and research scholars and to the general public. Books, documents, periodicals, extracts of laws, legislative bills and manuscripts, now on deposit in any of the University libraries, the State Historical Society of Wisconsin, the state libraries, or available through interlibrary loan from other institutions, will be photographically copied upon request, subject to the agreement made on the current order form.

The Department would appreciate receiving as exact information regarding the location of the desired book, etc., as it is possible for the customer to furnish, but the department must reserve the right to decline to copy any material which, in its opinion, is not suitable for photographic reproduction.

The photographic copies will be furnished either on microfilm, 35mm. noninflammable transparent permanent film to be read with a projection machine, or on page-size photoprints, as desired. Duplicate microfilm copies (positives) of any article that has been microfilmed are inexpensive and readily obtainable when the original microfilm (negative) has been left on deposit with the Department. In a few specific cases only copies will be supplied.

Detailed information will be found on the special order form which will be supplied on request. Rates for orders totaling over 1,000 consecutive pages will be quoted on application. Formal purchase orders, for interdepartmental orders as well as those from other institutions, are preferred. References or payment in advance will be required from individuals who are not connected with the University of Wisconsin.

Communications should be addressed to the Microfilm Department, The University Libraries, University of Wisconsin, Madison, Wis.

Microphotography and an Abstracting Journal

Mathematical Reviews, a new abstracting journal, sponsored by the American Mathematical Society and the Mathematical Association of America, is the first to offer to its readers complete copies of articles appearing in its pages on microfilm

or in the form of paper enlargement prints. Aided by funds granted by the Carnegie Corporation of New York, the Rockefeller Foundation and the American Philosophical Society, number 1 of the first volume has recently appeared. The microphotographic work is being undertaken at Brown University in the newly established microphotographic department. In view of the general interest in the operation of the plan, the description which appears on the inside cover page of the journal is reproduced as follows:

The subscribers to *Mathematical Reviews* can obtain, either on microfilm or as photoprints, the complete text of any article of which an abstract is printed, except books, or material of which the reproduction is prohibited by copyright law. The microfilm requires some sort of reading machine or projector in which standard 35mm. double perforated film can be viewed. Only *positive* prints are furnished; that is, the projected image appears as black words on a white background. Photoprints, on the other hand, are on sheets 11" by 14", and are similar to photostats. They can be read directly without the aid of any reading device. They also are furnished as positives, that is, black words on a white background.

The cost of microfilm is 2 cents per exposure, *each exposure* (except in the case of a very few unusually large journals) *containing two pages of text.*

Photoprints cost 16 cents per sheet, *each sheet* (except in the case of unusually large journals) *containing two pages of text.*

The minimum charge for any one order (but not for any one item when several items are ordered simultaneously) is 50 cents.

The process of ordering either microfilm or photoprint may be made clear by considering an example. Each abstract bears a serial number easily recognized by the fact that it is always preceded by the abbreviation "MF." A subscriber who wishes the text of item 18 would first note that the original article occupied pages 590 to 608. It therefore covers 19 pages, and will require 10 exposures of microfilm, or 10 sheets of photoprint for its reproduction. Hence the microfilm charge for this particular item would be 20 cents, and the photoprint charge $1.60. The charges so computed apply on any order totaling 50 cents or more; if the total is less than 50 cents, the charge for the entire order will be 50 cents.

In ordering:

1. Give your name and address.
2. State the serial number of the article or articles you wish.
3. Say whether you wish microfilm or photoprint.
4. Enclose cash for the amount of the order, either in currency, stamps, or by check.
5. Mail to Mathematical Reviews, Brown University, Providence, R. I.

In the case of large journals, only one page of which can be accommodated on a microfilm exposure or a photoprint sheet, you will be notified of the extra charge before the order is filled, unless you have indi-

cated on your order that the reprint is desired even at the higher price.

Individual orders for either microfilm or photoprint are so small that if credit books were kept and bills rendered, the extra clerical expenses would be a large proportion of the total. By requiring payment in advance, these charges have been eliminated, and the price to the customer correspondingly reduced. However, libraries and institutions which make extensive use of the service may be granted the privilege of payment at stated intervals.

Microphotography at the Bibliotheque Nationale

The Bibliothèque Nationale is now making a microfilm catalog of the Library of the Conservatoire. The catalog is not available in book form, and was not intended to be printed for a few years. Its photographic reproduction has been undertaken in an attempt to preserve it from possible destruction in time of war. The catalog is divided into 18 parts including: Monumental collections (operas, operettas, cantatas); Separate works of orchestra or chamber music; Musical literature; Periodicals, etc. All of the series may not be of interest to foreign libraries, but several are of universal appeal. Among these may be noted the following: *Manuscripts* (autographs and copies); *Reserve* (Reserve H, King's chapel and music); *Reserve H2 and H3* (national music, music from the Consulate and Empire periods); *Folklore songs* (romances and ballads). *Manuscript* and *Reserve* are classified in alphabetical order according to authors, *incipits*. *Reserve* includes valuable works of all kinds regardless of their value (antiquity, rarity, publication, binding, illustration notes, autographs, etc.). Only the *H Reserve* (King's music) and the *H2* and *H3* are classified from the reader's practical point of view; a few important items will be found under the names of authors, which are listed in alphabetical order. *Folklore* is classified in aphabetical order under the name of the provinces, for France, and under the name of countries, for foreign countries. *Songs* and *ballads* are listed aphabetically under the author's name or the *incipits*.

The cards are being filmed at 16 cards per exposure, and sets will be made available at the following prices: 10 copies or less, $30 per copy; more than 10 copies, $20 per copy. University Microfilms has circularized several libraries in an effort to secure the benefit of the latter price, and will receive orders from interested institutions or individuals, or they may be sent direct to the Bibliothèque Nationale marked for the attention of M. Leroy.

New Microfile Cameras

The Eastman Kodak Company has recently made available three new Eastman Microfile Recordaks. Pre-

viously, Recordak cameras were sold only to the United States Government, and were furnished to others on a rental basis.

The Microfile camera Model C is made of cast aluminum, and measures 6 x 9½ x 9½ inches. It weighs about 17 pounds. It is designed for 35mm. perforate or unperforate film in 100-foot lengths, and conversion

FIG. 1.— Microfile Recordak Camera Model C

parts may be secured to adapt it for use with 16mm. film. The magazine is divided into two compartments, and any amount of film may be removed from the take-up chamber without damaging the unexposed supply. A system of alarms insures operation only when the camera is properly loaded. Camera operation is controlled by a small electric motor which advances the film, and operates a bellows which provides suction to hold the film flat during exposure. A speed of 50 exposures per minute is possible. A film footage indicator and an exposure counter have been included. The camera has been fitted with a new type Kodak lens developed especially for this unit. Delineation of field is achieved by the projection of an illuminated aperture. Coupled with this aperture, a film advance allows only enough film to accommodate the original to be used. The minimum aperture for 35mm. film is 1¼ x ⅜ inches, while the maximum is 1¼ x 1¾ inches; for 16mm. film the minimum and maximum apertures are ½ x ⅜ and ½ x 1¾ inches respectively. The camera is intended for use on 60-cycle alternating current, but may be adapted for direct current on special order. Although designed for operation with the Microfile Recordaks C and D, the camera may be used without a stand or on a tripod.

The Microfile Recordak Model D incorporates the Microfile Recordak Camera and is designed for photographing flat documents up to 25 by 36 inches, or, with an accessory book cradle, bound books up to 18 inches in height. A welded steel base about 25 x 35 inches in size, in conjunction with a tubular braced aluminum column and supports for 4 or 6 lights, makes up the stand. It is intended for use on an ordinary table. Light con-

trol with an adjustable transformer and a voltmeter is provided. As an accessory a photoelectric cell and meter, mounted on a swinging arm, may be secured. Reduction ratios range from 10 to 20 diameters, or 8 to 18 diameters with a bookholder. The camera is maintained automatically in focus at any position on the column by an automatic mechanism. The camera support may be rotated 360° in order to use any desired placement of the original on film, while the entire column assembly may be rotated 180° to photograph originals larger than 25 x 36 inches, which are placed on a lower table or on the floor. A portable control box contains the field indicator control and the exposure button.

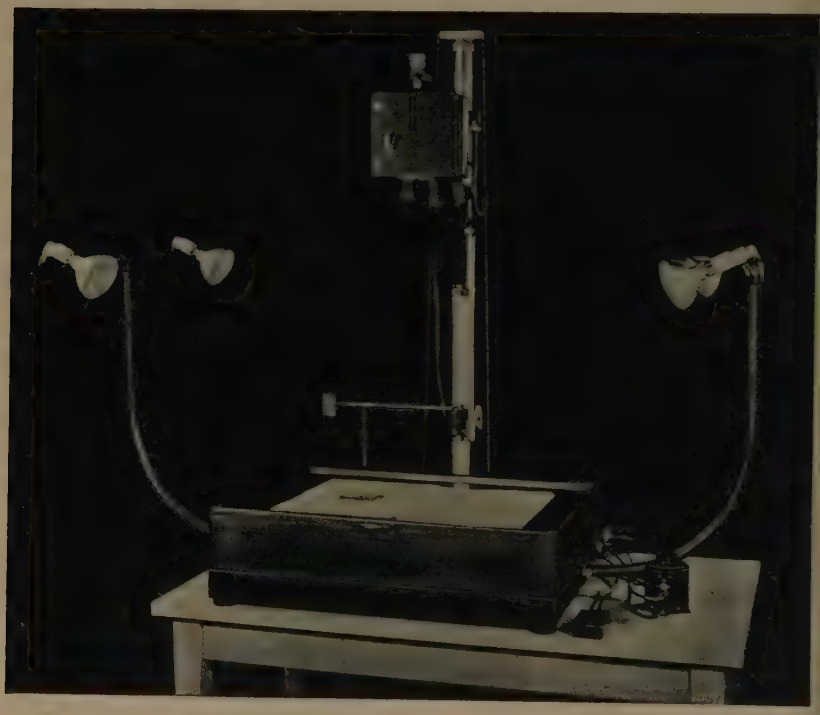


FIG. 2.—Microfile Recordak Model D

The Microfile Recordak Model C is a semiautomatic document copying machine for use with large bound volumes and newspapers. An accessory table fitted with clamping masks is intended for copying engineering drawings. The base measures approximately 4 x 6 feet, and is made of heavy welded steel; the camera support bracket and column are made

of aluminum. The latter is about 10½ feet high. The entire assembly weighs around 400 pounds. A reciprocating automatic bookholder accommodates books up to 18 inches in height, and documents as large as 37½ x 52½ inches. Precision controls are similar to those of the Model D described above, and the Microfile Recordak Camera is used. Ratios of 12 to 30 diameters reduction are provided.

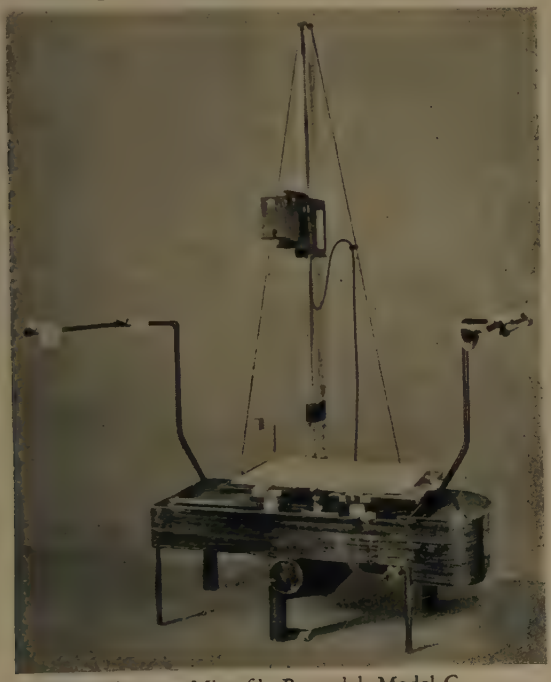


FIG. 3.— Microfile Recordak Model C

Prices for the respective units have not been announced, but may be obtained from the Recordak Corporation, 350 Madison Ave., New York, N.Y.

NEW MICROFILE CAMERAS INSTALLED

Three new Eastman Microfile cameras intended for library use have recently been installed. Brown University in connection with its new microphotographic laboratory has acquired one; the University of Chicago has added another to its well-equipped laboratory; and the third has been purchased by University Microfilms of Ann Arbor, Mich.

NEW MICROPHOTOGRAPHIC LABORATORY AT BROWN

Established in connection with the *Mathematical Reviews* project men-

tioned elsewhere in this issue, Brown University, aided by a subvention from the Rockefeller Foundation, has installed a complete microphotographic laboratory. In addition to the furnishing of copies of mathematical articles, the extensive and valuable books and manuscripts in the various libraries at Brown will be made available on film. It is planned also to utilize microphotography to build up one of the world's most extensive collections of works dealing with mathematics, using the already monumental Brown collection as a nucleus. A fund which will allow the acquisition of approximately 250,000 pages in negative microfilm has been provided by the Rockefeller Foundation. A large Recordak Microfile camera, capable of copying newspapers, has been installed. The laboratory is under the direction of Dr. Edward C. Roosen-Runge, who will describe the installation completely in an article scheduled for the next issue of the JOURNAL.

Ozaphane Corporation Absorbed by Ozalid Corporation

Mr. F. W. von Meister, Executive Vice-President of the Ozalid Corporation, has announced that an agreement has just been concluded with the Ozaphane Corporation by which the former has acquired the manufacturing equipment and business of the latter, including the trade mark "Ozaphane" as well as an exclusive license to manufacture all Ozaphane products.

The manufacture of special paper, film and glass plates for use with the diazo process will be continued by the Ozalid Corporation whose factory and general sales offices are located at Ansco Road, Johnson City, N.Y. An executive office is maintained at 354 Fourth Ave., New York, N.Y.

Recordak Library Projector Model C

The Recordak Library Projector Model C, previewed at the American Library Association annual meeting in San Francisco last summer, is now ready for the market. It consists of a walnut finished metal cabinet, supported table height, on four legs. The film projection equipment consists of two parts: a lamp house, and a projection head, both made of cast aluminum. A 200-watt lamp of the prefocused base type in conjunction with an efficient condensing system, incorporating heat absorbing filters, is contained in the lamp house, while the film gate and film-winding mechanisms are contained in the projection head. The projection head rotates through 360° and images may be viewed right side up on the screen regardless of their position on the film. Glass flats in a horizontal plane are used in the film gate, and a mechanism separates the flats, automati-

cally, while the film is being wound. A scanning lever allows a frame 35 x 46mm. to be read. Film advance,

FIG. 1.—Recordak Library Projector Model C

either slow or rapid, is controlled by two winding cranks on the right side of the cabinet. An f 2.0, 47mm. projection lens is used in conjunction with a first surface mirror to place the image on the screen. Variable magnification from 12 to 23 diameters is featured. Magnification is varied by means of a handle on the front of the screen. The handle is raised and the screen is moved, then the handle is released to lock the screen in position. The lens is automatically focused and locked with the screen. The screen is 18 inches square and made of a newly developed material which is said to provide a wide viewing angle and to eliminate hot spots and scintillation. Either 16 or 35mm. perforate or nonperforate film may be used in the machine.

The machine is intended primarily for use in libraries and newspaper offices. Final price and date of delivery have not been set, but the former is expected to be around $325. Further information may be secured from the Recordak Corporation, 350 Madison Ave., New York, N.Y.

ROTARY DISK RECORDER

A novel approach to the field of documentary photography is provided in the rotary disk cameras and other apparatus invented by Mr. James J. Dilks, now being prepared for the market by the Roto Photo Products Co., Haddon Heights, N. J. A special camera is employed to reproduce 600 double pages of a book or manuscript on a disk of film 10 inches in diameter. Approximately 2,000 bank checks or library cards, 600 bank statements or manuscript pages can be placed on the same area.

The advantages of compact storage, low cost and easy accessibility are claimed for the process. Documentary reproduction cameras and simple reading machines have been built but are not yet ready for the market. A booklet describing the entire rotary system is being prepared and when completed will be mailed on application.

Student Records Placed on Film at Temple University

Considerations of cost and space led the Registrar's Office at Temple University to put some of its records on film. The material involved consisted of approximately 308,000 cards 3 x 5 inches in size, containing the attendance record and individual grades for each student registered in the University from 1930 to 1935. These cards were filed in steel drawer cabinets and occupied a total of 4,888 running inches of space.

The cards have now been filmed with a Recordak Junior on 31 reels, each containing 100 feet of 16mm. film. The cards were placed lengthwise on the film, 3 cards occupying the film width, and were photographed in blocks of 6 at a time, that is, in 2 groups of 3 cards; it was thus possible to get 120 cards on one foot of film.

The total cost of filming was $231.50, which is less than the actual value of the file cases in which the cards were previously stored. Since the principal use of the records is for occasional reference or verification, it was deemed unnecessary to retain the originals after they were filmed. Consequently all of this drawer space was made available.

The film is read, when reference to it is necessary, on the Library's 35mm. Recordak reader. Although the film does not fit exactly, the projection is entirely adequate for the purpose.—J.P.D.

Summer Course in Microphotography at Columbia

The course on Microphotography for Libraries which was started last year in the summer session of the School of Library Service, Columbia University, will be repeated this year under the direction of Dr. Mary A. Bennett, and Miss Dorothy Hale Litchfield, Supervisor of the Film Collection, Columbia University.

The course is planned to give experienced librarians and library school students an acquaintanceship with the basic principles of photography and their applications to microphotography for library purposes. It is intended to equip students to install and operate a film service in any kind of library able to afford the minimum cost of equipment.

Instruction will be divided into two parts: daily lectures, and two three-hour laboratory periods per week. Students taking only the lectures will register for two points

redit; those who wish to take the laboratory work in addition will register for four points. Registration for laboratory work is limited to 20 students to be selected from applications received before June 1. There is a $5 laboratory fee. The lectures cover the physics and chemistry of photography including the optics of camera and reading machine, and the technique of developing, fixing, washing and drying negatives and prints. An historical review of microphotography is presented along with lectures on the acquisition, cataloging, classification and storage of film. Specific library problems will be discussed. Demonstrations of equipment and technique in photographing various originals will be provided.

Complete information may be secured from Dean Charles E. Williamson, School of Library Service, Columbia University, New York, N.Y.

Summer Course in Microphotography at Chicago

The University of Chicago Graduate Library School will again offer a course dealing with the problems involved in photographic reproduction and microphotography, in library and scholarly work, during the coming summer session, June 17 to August 23.

The course has been designed to meet the requirements of librarians, administrators and others who must cope with the various problems involved in photographic reproduction, primarily from an administrative point of view, rather than that of the technician. While there will be no laboratory practice as such, the lectures will include the basic and applied technical material necessary to insure a thorough understanding of the subject. Furthermore, through the cooperation of the University Libraries, an opportunity will be afforded, as a part of the course, to study and observe the equipment and operations in the extensive laboratories of the University of Chicago Libraries.

A general survey of the entire field will be undertaken and emphasis will be placed primarily upon problems encountered in large college and university libraries, although with some necessary modification the treatment will be equally valid for smaller college and public libraries. Attention will be given to the various applications of microphotography in preserving rare books, manuscripts, newspapers, etc.; in reducing the bulk of certain types of files; in interlibrary loans; in aiding library acquisition policies; and in serving as a medium for the distribution and dissemination of research and other materials, etc. Other subjects to be discussed include: the microphotographic laboratory, equipment and apparatus which will be

surveyed in detail and reviewed critically; basic and applied technical processes; problems in laboratory administration; general library problems; and American and European services, laboratories and projects.

The course will be conducted by Herman H. Fussler, Head of the Department of Photographic Reproduction of the University of Chicago Libraries, Associate Editor of the JOURNAL OF DOCUMENTARY REPRODUCTION, member of the American Library Association Committee on Photographic Reproduction of Library Materials, and American Library Association and government delegate to the International Congresses of Documentation in Paris, 1937, and Oxford, 1938, and author of numerous articles and technical studies in this field.

For further information, address Dean Louis R. Wilson, Graduate Library School, University of Chicago.

A Microphotographer's Scale

RALPH D. BENNETT

AN IMPORTANT quantity in microphotography is *reduction ratio,* which is the direct index of space compression. In attempting to achieve the ultimate in space compression, a limiting reduction ratio is often specified for a camera or an emulsion. Such a specification leaves out of consideration a vital element, namely type size. Dr. Leonard Sayce pointed out to the writer that the ultimate limitation could be better specified in terms of the microletter size and suggested an extension of the printer's scale to include such sizes.

Printers designate type sizes in terms of points. A point is one seventy-second of an inch, and the number of points refers to the overall height of the letters in seventy-seconds of an inch. Thus 12-point type (pica, commonly used in printing books) indicates letters 12/72 inch in height or 6 lines to the inch. Seven-point type (minion, commonly used in newspapers) indicates letters 7/72 inch in height, or a little more than 10 lines to the inch.

The scale, shown full size in Figure 1, is useful in measuring type size and computing feasible reduction ratios. For greatest usefulness the figure should be cut out, glued firmly to a pasteboard backing, trimmed to size and cut lengthwise along the full line. The scale at the left is useful for measuring type size. To accomplish this the index should be placed even with the bottom of a line of type, preferably at the bottom of a page or paragraph. Then count up 10 lines and at the bottom of the 11th observe the numeral on the scale. This is the type size in points.

The sliding scale is designed for calculating microletter sizes from known type sizes and reduction ratios. The procedure is as follows: Opposite the known type size on the upper part of the left-hand scale place the index of the right-hand scale. Then read down the right-hand scale to the desired reduction ratio. On the left-hand scale, opposite

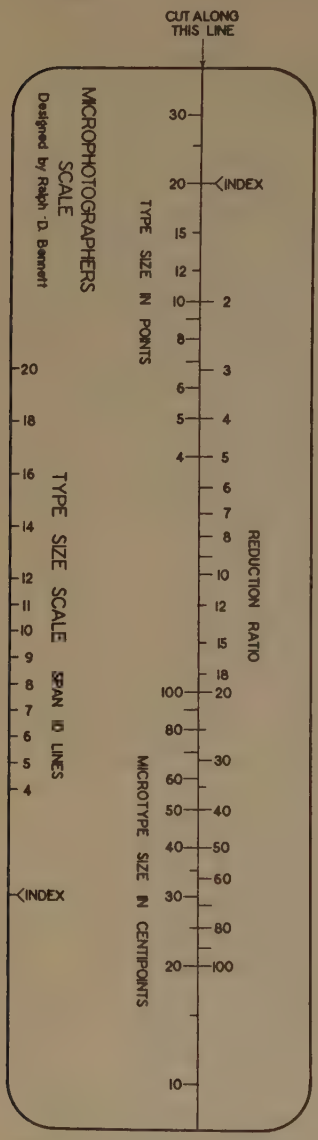


FIG. 1.—Microphotographer's Scale

this ratio, is the desired microletter size. The microletters now in common use are one point or less in height, and to avoid the inconvenience of fractional point designations, the writer suggests the use of hundredths of a point or centipoints. Thus if 7-point type (newsprint) is reduced 17½ times (as is common practice) the resulting microletters, as shown by the scale, will be 40 centipoints in height. Similarly, to determine the reduction ratio for 12-point type (pica) which would result in 40 centipoint microletters, set the index of the right-hand scale opposite 12 on the upper part of the left-hand scale. Then opposite 40 on the lower part of the left-hand scale read 30, the desired reduction ratio. Many other similar calculations are easily performed with the aid of the scale.*

* Photographic prints of the enclosed scale may be secured on application to the Photoduplication Service, Library of Congress, Washington, D.C., for 25c. These are furnished mounted on cardboard ready to be cut apart and used.—EDITOR.

Subjective Impressions of Efficiency in Reading Microfilm

WALTER R. MILES

A REPORT, *Eye Fatigue in the Reading of Microfilm,* was made to the Committee on Scientific Aids to Learning by its Advisory Committee composed of Adelbert Ames, Jr. (Chairman), Walter F. Dearborn and Wallace O. Fenn. This committee concluded that the following physical factors, either singly or in combination, might be responsible for eye fatigue if encountered after prolonged reading of microfilm:

1. Fixity of position of material in the microfilm reading machine
2. Poor contrast between projected print and background
3. Lack of sharpness of the projected print
4. Difference in boundary illumination surrounding the projected frame of microfilm as compared to boundary conditions surrounding the ordinary book page
5. Glare projected through a translucent screen of a microfilm reader

These and other factors were discussed in the report which was founded on theoretical considerations rather than on objective data. Since the relative frequency of fatigue from microfilm reading was not known, the committee recommended that attention be given to the general problem of eye fatigue and to the selection of tests appropriate for measuring such fatigue. While this extension of the problem was under consideration by a newly appointed committee, an opportunity for securing additional subjective impressions on the reading of microfilm presented itself.

A self-addressed postcard was prepared containing the following queries:

1. Does microfilm reading fatigue your eyes more than ordinary reading? YES NO
2. If you answer YES, what do you think causes it?
3. What reading device are you using?
4. Have you any practical suggestions?

Through the cooperation of Science Service, this card was included in a mailing to 3,500 individuals and institutions known to have expressed interest in microfilm. In addition cards were sent to about 1,400 special libraries, 650 college libraries and 660 college chemistry depart-

TABLE 1

REASONS SUGGESTED FOR FATIGUE FROM MICROFILM READING

Fatigue Due to Equipment	*No.*	*Fatigue Due to Film*	*No.*
Inferior equipment, inadequate device (almost all used hand device)	18	Poor, carelessly-made films	7
Improper or insufficient magnification (same group)	7	Films of old, faded, illegible manuscripts	2
Blurred image, fuzziness, murkiness, lack of focus over entire screen (most of these used Argus)	29	Waves in films	1
Monocular vision	6	Non-uniform density of films	2
Glare, looking into light source, too strong light, spotty lighting	20	Work on negative films harder than on positive	2
Transmitted rather than reflected light	5		
Insufficient light	2		
Light from outside	1		
Insufficient contrast	12		
Too much contrast of black on white	1		
Constant accommodation changes (from reader to notebook)	2		
Rolling eyeballs	1		
Unconscious staring	1		
Convergence	1		
Flicker or slight movement	3		
Screen not fine enough	1		
Field not flat enough	1		
Glass screen	4		
Posture	2		
Neck strain	1		
Nonportability of machine (indirectly to blame for posture fatigue)	1		

Answered "Yes" to question 1: 112*
Answered "Yes," if small magnifier is used; "No," if Argus: 5
Answered "Yes," if Argus translucent screen is used; "No," if Recordak: 1

*Many people gave more than one possible reason for fatigue. Each has been listed under the proper heading.

ment chairmen. In all a total of 6,200 cards were sent out. The percentage of return was expected to be low as microphotography is a relatively recent development. Two hundred and forty-eight cards were returned.

A large majority of definite replies were affirmative, claiming that microfilm produces more fatigue than ordinary reading of print on paper. There were 118 "Yes," 17 qualified negative, 45 unqualified "No," and 68 indefinite answers to the first question on the card. In Table 1

TABLE 2

TYPES OF READING DEVICES USED

Devices Used by Persons Replying "Yes" to Question 1	*No.*	*Devices Used by Persons Replying "No" to Question 1**	*No.*
Argus	45	Devices used among this group were:	
Argus photographic enlarger	1	Argus	23
Eastman Recordak	8	Microfilm viewer	1
Microfilm reader	2	Recordak	4
Leica VIIIs projector	2	Projector	2
Leica Lesepult	1	Homemade projector	3
Projection lantern	1	Microscope	2
S. V. E. Tripurpose projector	1	Spencer binocular microscope with metal stage for holding film	1
Picturol projector	1	Spencer's pocket	1
French Seidell viewer	3	Optigraph	1
Binocular microscope	8	Leica	1
Low-power binocular scope	1	Device not indicated	6
Optigraph	4	"Have none"	1
Homemade projector	3		
Homemade machine like Argus	1		
Homemade reader	1		
$1.50 viewer (French Seidell)	5		
Viewing lens	4		
Small hand reader	4		
Small magnifier	4		
Small Spencer reader	3		
Special hand magnifier	2		
"Gadget viewer"	1		
Pocket reader	1		
Small 1 x 1"	1		
B & L film magnifier	1		
7 x aplanat	1		
International	1		
10 x glass	1		
Fedco reader	1		

Answered "No" to question 1, but offered no suggestions: 45

* One person named two devices.

the "Yes" answers have been broken down in terms of the second question. The three most commonly reported reasons for fatigue—blurred image or lack of sharpness (29 responses), glare (20 responses) and insufficient contrast (12 responses)—represent three of the five factors which the Advisory Committee put forward in its report. Possibly those who phrased their reply "transmitted rather than reflected light" were referring to the factor of glare. It seems probable also that the replies citing "poor, carelessly made films" are equivalent to those mentioning blurred image or insufficient contrast. It is interesting to note that only three people referred to posture or neck strain as a cause of fatigue and that seemingly no one identified the factor of boundary conditions surrounding the projected frame of microfilm. Five of those who replied affirmatively indicated that fatigue from reading microfilms was present if the films were read by a small hand magnifier, but that this task was not more fatiguing than ordinary reading if the Argus Microfilm reader was employed.

A tabulation of the types of reading aids used by those answering "Yes" or "No" to the fatigue question is given in Table 2. It appears evident that the group reporting positive fatigue includes a large percentage of users of small hand magnifiers or other improvised reading devices. The group that answered "No" to the fatigue question uses the simple improvised aids less frequently. The reading device most frequently used by both groups is the Argus Microfilm Reader, in the proportion of 45 of the "Yes" group to 23 of the "No" group. The same proportion of affirmative to negative is shown in the users of the Eastman Recordak, 8 in the "Yes" group, and 4 in the "No" group.

A few of those reporting fatigue in connection with the reading of microfilm made suggestions. These cover rather wide range as shown in Table 3. This table also includes some suggestions made by those who answered "No" to the fatigue question but still apparently felt that some improvement could be made. Several of the suggestions relate to increasing the contrast in the film so that the amount of light used in projection can be reduced. Others relate to the possibility of manipulating the intensity of the light. If the reader could modify the light appropriately for the material, he would have the satisfaction of feeling that an adjustment had been made for his comfort. Several of those using

hand magnifiers ask for improved but quite inexpensive reading devices to cost between $5 and $25. Several efforts to design high-powered fully-corrected hand magnifiers have met with scant success. With the advent of lenses made from newly developed plastics, an efficient low-priced reading device may appear. Progress is also being made on the production of an inexpensive reading machine.—EDITOR.

TABLE 3

SUGGESTIONS FOR IMPROVEMENT IN PRESENT DEVICES

More contrast in films, permitting lower level of illumination and decreasing glare	3
Give wider field of clear projection	5
Blacker films	3
Better focusing device	3
Color film yellow or green	2
Try color screens of various colors to modify contrast	1
Soft-colored light	1
Wear dark glasses	1
More transparent, less yellow film —like cellophane	1
Finer grain films	1
Finer grain developer	1
Better copying lens	1
Cement celluloid sheets to glass	1
Opaque screen type of reading device	1
Use screen of flat paint, or plywood finish rather than glossy	1
Improve screen's scattering power	1
Hood for reader to shut out light from room	1
Adjustable light intensity	1
Rheostat to vary intensity of light	1
Set glass plate deeper to exclude room light	1
More light on projector	1
Less candle power in bulb	1
Read by reflection rather than by transparency	2
Use polaroid glass in manufacture of reader	1
Minicam enlargers	1
Binocular reader which could be used while sitting comfortably in a chair, not bending over a table	1
One that could be moved about as easily as a moderate-sized book	1
Place mechanism for film changing below screen to avoid stretching or standing	1
More portable reader	2
Adapter for binocular microscope	1
Improve crank (Argus)	1
Could film be supplied as positives?	1
Adjust light on film so contrast with room light is less	1
Place reader so that extraneous light does not strain eyes	1
Keep room completely dark	1
Light green rather than white paper	2
Less expensive equipment	1
Less cumbersome equipment	1
Machine hard to operate—improve method of keeping film on spools	1
What became of International Filmbook reading machine?	1

Readex Microprints

JOHN TENNANT

A NEW APPROACH to the application of microphotography in the fields of scholarship and scientific research is indicated by the formation of the Readex Microprint Corporation. This firm, which has incorporated the ideas and processes of Mr. Albert Boni, a New York publisher, reproduces microcopy on paper and calls the product microprint in order to distinguish it from microfilm.

The Readex Corporation has announced a reading machine which will be available for distribution in March of this year, and an extensive

FIG. 1.—The Readex

publishing program which is now under way. Publications in microprint form appear in units, each consisting of a sheet of paper 6 x 8 inches in size, containing 100 pages of textual matter. These are inserted in the Readex reading machine, which utilizes the technique of reflection projection from the opaque paper to a translucent screen.

The idea of making and publishing microphotographic reproductions

of reference works, mathematical and technical data, not readily accessible to the student or the general public, seems first to have occurred to Sir John W. Herschel at some time prior to 1853. He also visualized the miniature facsimile reproduction of private notes and other material in small editions intended for individual or group use. In a communication to *The Athenaeum,* London, dated July 6, 1853, Herschel enclosed a letter from John Stewart, a relative then residing at Pau, France, in which reference was made to certain interrupted experiments in microphotography. Stewart wrote: "Meanwhile, one of my friends here, Mr. Heilmann, following the same pursuit, has lighted on an ingenious method of taking from glass negatives impressions of different dimensions, with all the delicate minuteness which the original negative may possess." He continued with an outline of the simple process used by Heilmann to enlarge micro images to any desired degree, and concluded his letter with the following paragraph: "Should your old idea of preserving public records in a concentrated form on microscopic negatives ever be adopted, the immediate positive reproduction on an enlarged, readable scale, without the possibility of injury to the plate, will be of service." In the communication enclosing Stewart's letter, Herschel writes: "...The utility of this mode of reproduction seems indisputable. In reference to its concluding paragraph (quoted above.—EDITOR) I will only add that the *publication* of concentrated editions of works of reference, etc., is thus brought within the reach of anyone possessing..." [the equipment required for the Heilmann method outlined in Stewart's letter].

The technique of microphotography was developed to a high degree of perfection in France and England in the '50's and '60's of the last century. The methods of Dagron, Shadbolt, Hislop, Dancer and others were published in the early volumes of the *Journal of the Photographic Society* of London, and the *Bulletin de la Sociéte Française de Photographie,* at Paris. Serious application of the art during this period, however, seems to have been limited to the production and sale of "card photographs" in which mosaic portrait groups of "celebrities" of the day were assembled within the narrow limits of the *carte de visite,* and in the "Pigeon Post" of the siege of Paris, in 1870.

A careful search of the literature seems to indicate that Duncan C.

Dallas was the first to apply the technique of microprint. Mr. Dallas, a well-known engraver in London, was active during the years 1856-84. In or about 1866 he produced an edition of a miniature reference Bible in pearl type on pages which were reduced to 1 9/16 inches wide by 2 3/8 inches high. The pages were produced on a printing press by processes which Mr. Dallas held secret and which seem never to have been disclosed. A specimen page of this Bible is reproduced in facsimile, perhaps from the original plate, in the *Catalogue* of the Crystal Palace Photographic Exhibition, which was held in London in 1898.

The next noteworthy worker in the field was Georg Scamoni of St. Petersburg, who published in 1872 his *Handbuch der Heliographie nebst praktischem Wegweiser im Gebiete der bezuglichen Gravirkunst, Metall-Aetzung und Vergoldung, Galvanoplastik, Photosculptur,* etc., in which he describes, minutely, the processes and techniques by which he successfully made microprints at unusually high reductions. His book is well illustrated.

Fifty years later, 1921-22, Admiral Bradley A. Fiske (U.S.N., retired) proposed the publication of books, made by conventional photoengraving processes, in microprint form. These were to be read with the aid of a loupe magnifier, which, when covering a full-page reproduction, limited the magnification to from three to four diameters. Admiral Fiske's proposal received wide publicity at the time of its announcement, and his work in this field stimulated the idea of using microprint in everyday life and work.

More recently, Dr. Lodewyk Bendikson, Director of the Department of Photographic Reproductions of the Huntington Library, San Marino, Calif., employed a process to produce microprints on silver emulsion photographic paper at reductions of from 7 to 8 diameters, thereby reproducing 40 or 50 book pages on an area of 5 x 8 inches. The microprints are usually read with a low-power microscope.

The most recent worker in the microprint field, Mr. Albert Boni, did not arrive at the Readex Microprint system from a study of the activities of his predecessors. Instead, he conceived the basic idea while looking through an album showing the remarkable enlargement possibilities of the tiny negatives made with one of the miniature cameras now in world-wide use. If the enlargement possibilities could be reversed

and facsimile reproductions of documentary material could be made in greatly reduced size, a suitable enlarging machine would make them as easy to read as an ordinary book. The plan would effect economies in the material and production of books. It would make possible the inexpensive duplication of out-of-print books and sets. It would also save a great deal of space in crowded public and private libraries. Mr. Boni set to work to develop methods for making and reading such miniature facsimiles. The results are now being marketed as the Readex system.

The Readex system consists of (1) a perfected method of reproducing books or any kind of documentary material in greatly reduced facsimile in the form of a paper print, and (2) the Readex, a reading machine in which the minute facsimile reproductions are projected on a translucent screen, automatically focused in sharp definition. By turning a knob this screen image may be enlarged from 11 to 15 diameters to suit the reader's convenience and comfort. The microcopy of the original is produced by photographic reduction on a negative, from which either direct contact photographic prints may be made on a special diazo paper or, after intermediate processing, by impressions from a printing press. The microprint so obtained is characterized by its brightness and sharpness of definition. The microprint unit for use in the Readex is a sheet of white paper, 6 x 9 inches, containing 100 facsimile pages, each .5 x .8 inches in size, consecutively arranged in 10 rows of 10 pages per row, reading from left to right. Thus, a volume of 400 pages would be reproduced on only four pages. When the work reproduced has less than 100 pages, the facsimiles correspond to the number of pages in the original. Each unit bears the title page of the book, or other identifying information, in a size plainly readable to the naked eye.

The Readex is a compact, streamlined instrument no larger than a small cash register. The optical system has been carefully calculated and is designed to give a softly-brilliant image on a screen made of plastic, laminated between two sheets of glass. Extended research was undertaken to eliminate hot spots and provide a wide viewing angle. The Readex may be used to read short strips of positive microfilm if a white paper is placed under the film. An adapter for the use of roll microfilm will be supplied if there is sufficient demand.

To find a reference, the microprint unit to be read is selected, and the drawer at the base of the Readex is withdrawn; the cover glass is lifted and the microprint is placed in position beneath it; the drawer is closed. Two control knobs, one for units and another for tens are located on the front of the drawer, and are marked 0 to 9. To find any desired page the two knobs are turned to the tens and unit figures of the desired page. The light is turned on and the page appears on the reading screen.

It should be emphasized that microprint is not competitive with conventional microfilm. Instead, it is supplementary. For single copies or editions of less than 25 copies as well as for applications where speed is essential, microfilm remains supreme. The advantages of the process, may be summarized as follows: Microprint is economical, as the production costs are reduced in almost direct relation to the scale of reduction. It is primarily a method for edition publication where economies may be achieved in editions of from 25 copies upward. As the size of the edition is increased, the economies also increase and at maximum efficiency may amount to only one per cent of normal publication costs. Microprint is convenient to use and file. As it is issued in the form of paper prints, scholars and others may handle it easily and in ways to which they have become accustomed. It may be filed in standard-sized file cabinets and containers. Storage problems are identical with those for books and similar materials. The microprint unit is not as subject to scratches, abrasions and to damage in unskilled hands as microfilm. The location of material is simplified as previously explained.

The Readex Microprint Corporation has stated that it does not plan to offer a universal microprint service. Instead, it will engage in a general publishing business supplying reproductions of selected titles, and possibly original publications, for use on the Readex reading machine. The corporation will also distribute the reading machines. An extensive publishing program has been formulated and includes a library of 1,000 titles for home use, out-of-print catalogs and bibliographies, files of technical periodicals and other related items. Costs for the various series have not yet been settled, as in each case the cost will be governed by the size of the published edition. Plans for meeting demands for a single copy of a particular work are also under discussion.

FOREIGN SECTION

PHOTOMICROGRAPHY[1] IN GERMANY[2]

Dr. W. Schurmeyer
(translated by Dr. L. E. Hinkle)[3]

Long years of theoretical research and experimentation in many parts of the world demonstrate that photographic copy film (microfilm) can render valuable services in many fields of documentary work. For a long time the basic obstacle to the practical application of these small pictures on strips of film was the lack of a reading apparatus which met all the necessary requirements. Recently, however, the original inadequate constructions have been improved. In Germany we now have in the Zeiss Ikon reading apparatus an instrument for reading film strips. Thus, it is now possible to make available to the public, in a form entirely satisfactory to even the most exacting readers, literary works which cannot be placed at their disposal in the original form. The Zeiss reading apparatus is constructed on the principle of "transparent projection." The lamp house with the light source is so constructed that the unavoidable heat that is generated does not bother the reader or damage the film. The negative holder and film transportation mechanism are located at table height so that convenient operation is obtained. It is mounted in such a way that it can be turned in any direction, so that vertical as well as horizontal projections can be made interchangeably. In order to project individual pictures as well as short and long reels, three interchangeable negative holders are provided. The

[1] By an inversion of meaning, *photomicrography* in Germany refers to the making of a reduced-size photograph of a large original, while *microphotography* refers to the making of an enlarged photograph of a minute object. In the United States, the exact reverse is understood.

[2] International Federation for Documentation, XV Conference, The Hague, 1939, *Communicationes*, II.

[3] This translation was prepared by Dr. L. E. Hinkle, Professor of Modern Languages and Head of the Translation Service of the Modern Language Department, North Carolina State College of the University of North Carolina, Raleigh, N.C.

transport mechanism for long reels up to 25 meters in length possesses a reversible rapid drive.

The negative is normally projected at a 9½-diameter magnification. The lens is easily interchanged, and may be replaced by an objective of 50mm. focal length. With this objective a negative of 24 x 24mm. is reproduced on the screen magnified 13 times. Entire pages of daily newspapers which have been copied on a 24 x 36mm. negative can be projected successively so that only two thirds of the page are on the screen at a time. This expedient was selected so that the screen as well as the entire apparatus would not be too large and unwieldy. The projected picture itself is not uniformly bright and clear to the extreme edges. Therefore, in order to reduce to a minimum the unavoidable eye fatigue which occurs after long reading of the transparent film projections, a type of folding Venetian blind has been introduced which will uncover the picture as desired.

The apparatus is furnished with a special mounting for installation on a lecture room table. In this way plenty of space is available for other working materials or for writing and making calculations. The final form of the apparatus was selected on the basis of practicability after extensive cooperative experiments over a period of several months between the Prussian State Library in Berlin and the State and University Libraries in Breslau. From these investigations numerous technical improvements resulted.

The copying for these experiments was done by automatic photocopy apparatus which has proved satisfactory for many years in the Prussian State Library. These machines were furnished with special equipment for library work, particular attention being given to the results obtained by earlier experimentation.

Since a practical application of photocopy film, especially in the case of interlibrary loan, is possible only where a coordinated, fast-working system is used, the possibility of providing 25 of the larger libraries in definite localities with copying apparatus and at the same time furnishing about 200 borrowing libraries with projection equipment has recently been considered in Germany. Through suitable loan contracts, a finance company will make apparatus available to libraries which are financially unable to acquire them otherwise. Since it would be uneconomical to establish a complete film processing plant with developing and drying apparatus, whose operation requires a skilled technician, in each of the 25 libraries mentioned above, the exposed reels from these libraries are to be sent to a central developing plant. There they will be developed and

dried in a darkroom outfitted with the most modern equipment and classifications are made in the order of their receipt. Before each classification the classification label, along with the serial number of the borrowing library and a short identification of the sending library, is photocopied. These identifying labels are made large enough so that they may be read with the unaided eye directly from the negative reel. At the end of each day's copying, the exposed film is cut off and sent undeveloped in a transport container through the mails to the central processing plant. There the processing begins on the day that the film arrives. The reels are then cut up into separate divisions and sorted with the materials coming in from other places. All types of library material from the different loaning divisions are assembled and can usually be sent back through the mails on the evening of the same day.

By this system uneconomical division of film processing is avoided and at the same time a saving in the working staff and processing materials is effected. In addition, the protection of the most expert handling is assured. Even in cases where several libraries are close together the roundabout method of sending film to a central laboratory involves no delay, since the film is sent through the mail and the processing is carried out more efficiently and rapidly than would be possible in a small darkroom which was not well-equipped. At any rate the user will receive his film strips much more quickly than formerly when the original volume was sent by parcel post.

Since this method is to be introduced in Germany mainly to alleviate the loaning duties of the great central libraries whose inflexible systems often deprived their own local communities of the use of certain borrowed material for a long time, there is a movement to supply the borrower with a film reel at 10 pfennig for 5 or 6 exposures instead of sending him the original volume as formerly. Since 2 pages of a book are generally taken with 1 exposure, the user receives the first 10 or 12 pages of the book for 10 pfennig. Each additional exposure (two pages) will cost him five pfennig. The setting up of a central processing plant would make this low price possible. The libraries will incur no higher costs than previously since the price for five to six exposures corresponds approximately to the postage for sending a volume back and forth. Also the slight inconvenience to the user not having a reading apparatus and, therefore, having to use the equipment in the reading hall of a library is offset by the great advantage of indefinite use since the film reel becomes his property at the above-named price.

This method is of great impor-

tance to the library as it does not deprive local readers of the use of books; damage to the bindings by careless handling during transportation is avoided; and losses by accident and theft are eliminated. It is obvious that in advocating the exchange of film strips we are not proposing to change the entire German system of library loans. However, daily newspapers, periodicals, current brochures and rare books, especially manuscripts and works that the owning library cannot afford to loan should in the future be brought to the reader in this manner. As far as daily newspapers and periodicals are concerned, the advantages of the use of photocopy are especially obvious because the user of such publications generally needs only one article (a small fractional part of the volume) and thus others are deprived unnecessarily of the use of the remaining material.

The great advantage of international library loans has already been pointed out frequently by others and need not be discussed at this time.

It is certainly to be expected that with the existence of such equipment, the scope and range of work which will be handled in the future by film photocopy in libraries will quickly broaden, and that in a few years all libraries will be equipped with such apparatus.

PATENT SECTION

For a considerable time the editors of the JOURNAL have hoped to include a section of significant or interesting patents. This has now become possible through a grant received from the Committee on Scientific Aids to Learning for the purchase or reproduction of the printed patents in the United States Patent Office from which these lists have been compiled. It is, of course, impractical to list all of the photographic patents which have been issued. It is hoped, however, in subsequent issues of the JOURNAL to publish a representative selection including old as well as new patents relating principally to equipment. It may be possible in the future to include a few outstanding foreign patents as well. Readers are urged to submit pertinent items which may come to their attention for inclusion.

In format, the listing will include the patent number, the date of issue, the patentee and assignee (if available), a brief description of the published purpose or title of the patent, and an indication of its size; for example, 4p. means 4 pages, 4pl. means 4 plates of accompanying drawings.

U.S. 1,614,619, Jan. 18, 1927, Jacob J. Kaplan, Boston, Mass.

An apparatus for photographing both sides of checks, etc. to be kept as a permanent record on moving picture film. 4p. 4pl.

U.S. 1,939,446, Dec. 12, 1933, Raymond M. Hessert, Philadelphia, Pa.

An improved document photographing machine for recording both sides of documents, including provision for reversing document. 6p. 8pl.

U.S. 1, 941,004, Dec. 26, 1933, Raymond M. Hessert, Philadelphia, Pa.

Combined photographing, endorsing and perforating machine for checks and the like. 10p. 11pl.

U.S. 1,973,483, Sept. 11, 1934, Carter J. Hughey assigned to Eastman Kodak Co., Rochester, N. Y.

Control for power-driven photographic apparatus particularly adapted for photographing documents. 2p. 2pl.

U. S. 1,976,346, Oct. 9, 1934, Carter J. Hughey assigned to Eastman Kodak Co., Rochester, N. Y.

Control for a photographic document-recording apparatus. 7p. 2pl.

U.S. 1,981, 452, Nov. 20, 1934, Carter J. Hughey assigned to Eastman Kodak Co., Rochester, N. Y.

Auxiliary feeding hopper for a document-handling machine. 3p. 1pl.

U.S. 2,033,290, March 10, 1936, Paul Landrock assigned to Photostat Corp., Providence, R. I.

Photographic copying machine. 7p. 6pl.

U.S. 2,033,712, March 10, 1936, Roy S. Hopkins assigned to Eastman Kodak Co., Rochester, N. Y.

Enlarging printing machine for making enlarged prints from relatively small negatives in strip form. 6p. 6pl.

U.S. 2,033,713, March 10, 1936, Carter J. Hughey assigned to Eastman Kodak Co., Rochester, N. Y.

Indicating system for rolls of strip material, and an indicator for signifying the amount of strip material on any one of several rolls. 4p. 2pl.

U.S. 2,038,302, April 21, 1936, Antonio Longoria assigned to Automatic Voting Machine Corp., Jamestown, N. Y.

Photographic apparatus adapted to be used for photographing the indicated totals on automatic voting machines and the like. 3p. 2pl.

U.S. 2,041,478, May 19, 1936, Max Niederle, Miami, Fla.

A means for light or photoprinting adapted for photo-rotary printing to obtain exact and perfect reproductions of any original such as a photograph, painting, drawing, printed or drawn page. 6p. 4pl.

U.S. 2,042,005, May 26, 1936, Le Roi E. Hutchings assigned to Remington Rand, Inc., Buffalo, N. Y.

Camera for duplicating record cards, for economically producing accurate positive-reading photographic duplicates of discrete record cards and sheets of uniform size. 6p. 3pl.

U.S. 2,043,004, June 2, 1936, Whitten P. Lloyd and Maxwell H. Hill assigned to the Haloid Co., Rochester, N.Y.

Photocopy machine of the type in which drawings, documents and the like are photographed on a sheet of sensitized paper. 5p. 8pl.

U.S. 2,043,928, June 9, 1936, Anthony Ludwig, Washington, D. C.

Photographic printing machine or apparatus for making enlargements rapidly on bromide or chloride paper from negatives of small size. 12p. 4pl.

U.S. 2,050,571, Aug. 11, 1936, John J. Johnson, Dallas, Texas.

Photographic apparatus for making a photocopy in a darkroom from an outside subject. 3p. 4pl.

U.S. 2,060,286, Nov. 10, 1936, Fred Doetzel, Jr., Cedar Rapids, Iowa.

Washing and developing device for photographic prints such as blueprints, photostats, vandyke prints and the like. 5p. 4pl.

U.S. 2,115,014, April 26, 1938, Rupert H. Draeger, U.S. Navy.

Reading machine indexing mechanism for microfilm reading machines. 3p. 1pl.

U.S. 2,117,754, May 17, 1938, William F. Gordon Bell assigned to The McKibbin Neon, Inc., Norwalk, Conn.

Photographic enlarger lamp house using an electric discharge tube. 4p. 1pl.

U.S. 2,121,061, June 21, 1938, Leonard G. Townsend, Washington, D. C.

Method of and apparatus for the indexing and photo-transcription of records. 13p. 5pl.

U.S. 2,132,716, October 11, 1938, Otto Wittel assigned to Eastman Kodak Co., Rochester, N. Y.

Slide changing device for a projector. 3p. 1pl.

EDITOR'S CORNER

The Writers

MISS GRACE G. GRIFFIN, well-known editor for many years of the *Writings on American History*, is in charge of the Project "A" transcript materials, Division of Manuscripts, Library of Congress. MR. MAURICE F. TAUBER, Head, Cataloging Division of Temple University Library, is now on leave at the University of Chicago completing work for a degree. His paper was first presented in connection with the summer session course in Microphotography given by Mr. Herman H. Fussler last year at the University of Chicago. MR. ROBERT P. GRIFFING, JR., a former instructor in the Department of Fine Arts and Archeology, Princeton University, is now completing work for the degree of Master of Arts at the same institution. MR. DONALD N. WILBER, a graduate of Princeton and holder of a degree of Master of Fine Arts in Architecture from that institution, has spent several years in archeological excavation and research in the Near East and Europe. He is at present a staff member of the American Institute for Iranian Art and Archeology. Both Mr. Griffing and Mr. Wilber have volunteered their services to aid in the dvelopment of Color Slides Cooperative as codirectors until an organization of a more permanent nature is formed. DR. MARY A. BENNETT is Supervisor, Department of Binding and Photographic Reproductions, Columbia University. MISS DOROTHY H. LITCHFIELD is in charge of the Microfilm Department of the University Library. DR. AGNES TOWNSEND is a member of the Department of Physics, Barnard College, Columbia University. Dr. Bennett, Miss Litchfield and Dr. Townsend jointly gave the summer session course in Microphotography at Columbia University in 1939. DR. RALPH D. BENNETT is Professor of Electrical Engineering, Massachusetts Institute of Technology. The two studies published in this issue were prepared in connection with a special project undertaken at the request of the Committee on Scientific Aids to Learning. DR. WALTER R. MILES is Professor of Psychology, Yale University. He was chairman of the committee which organized the Symposium on Visual Fatigue held in Washington, in 1939, and is a member of the Committee on Scien-

tific Aids to Learning's Committee on Visual Fatigue. MR. JOHN TENNANT, who at the request of Mr. Albert Boni prepared the article on "Readex Microprints," is the former editor and publisher of the *Photo Miniature*. MR. HERMAN H. FUSSLER, one of the associate editors of the JOURNAL, is Head, Department of Photographic Reproduction of the University of Chicago Libraries. MR. EUGENE B. POWER is President, University Microfilms, Ann Arbor, Mich. DR. CARL W. MILLER is a member of the Department of Physics, Brown University.

The Third Year

With the appearance of the present number, the JOURNAL enters its third year. The response reflected in subscriptions and in contributions of material has been most gratifying. Particular thanks are due to the American Library Association, which from the headquarters office in Chicago has handled the production problems as well as those of distribution, finance and accounting. The American Library Association's Committee on Photographic Reproduction of Library Materials has, as the direct parent of the JOURNAL, determined the basic policies, and the Committee membership has given freely of its time and energy in assisting the editor. The associate editors have been indefatigable in securing material, in reading manuscripts and in preparing needed articles.

Without the support of the Carnegie Corporation of New York the JOURNAL might never have become a reality. To all, sponsors, contributors, assistants and subscribers, the editor wishes to extend his thanks.

The present number differs somewhat from its predecessors in that two sections, those of Bibliography and Book Reviews, are missing. They will return in the subsequent number. Through the support of the Committee on Scientific Aids to Learning, it has become possible to inaugurate a review of significant patents relating to phases of documentary reproduction. Both new and old patents relating to equipment or devices, in whole and in part, processes, and the like will be indicated. There will be no attempt to cover the subject of photography as a whole; with the present increasing interest in photography, a quarterly twice the size of the JOURNAL could be devoted solely to the listing of patents of photographic interest. The Translation Section, provided through the cooperation of the Translation Service of the North Carolina State College of Agriculture and Engineering of the University of North Carolina at Raleigh, has been a decided success and will be continued. Many interesting and valuable articles have been received and will be

published as soon as space is available for their inclusion.

The readers, however, in the last analysis are those to be served. The editorial office welcomes suggestions and comments by readers on policies, needed articles or material, and will attempt to include in the JOURNAL all pertinent material which will be of general interest.

The Legality of Microfilm Records

In the microfilming of governmental and business records and particularly in the reproduction of permanent records of an archival type, the legality of the reproduction is often of paramount importance. Recently in New York a decision involving microphotography was handed down by the United States Circuit Court of Appeals. Reported in the *New York Law Journal,* 102, no. 129 (December 5, 1939), the case of the United States of America, plaintiff-appellee *v.* Martin T. Manton and George M. Spector, defendants-appellants is of the utmost importance in defining the position of microfilm reproductions in the courts. Based, in this instance, on the admissibility in evidence of certain documents produced by the Recordak Corporation, the judgment was affirmed.

The case was tried before Mr. Justice Stone, Mr. Justice Sutherland, and Clark, Circuit Judge. The opinion of the Court as presented by Mr. Justice Sutherland is herewith reproduced in part. Attention is particularly directed to the footnote 2.

The trial court over objection admitted in evidence what are called recordak facsimiles of checks. The objection made to this ruling of the court is that such facsimiles do not constitute the best evidence. These recordaks are photostatic reproductions of the fact of checks which have been paid; and they were offered as evidence of such payments. It is argued that the original checks themselves were the best evidence and that their absence should have been accounted for as a prerequisite to the admission of the recordaks. With this contention we cannot agree. These recordaks are made and kept among the records of many banks in due course of business and are within the words of 28 U. S. C., sec. 695.[2] [(2) In any court of the United States and in any court established by Act of Congress, any writing or record, whether in the form of an entry in a book or otherwise, made as a memorandum or record of any act, transaction, occurrence, or event, if it shall appear that it was made in the regular course of any business, and that it was the regular course of such business to make such memorandum or record at the time of such act, transaction, occurrence, or event or within a reasonable time thereafter. All other circumstances of the making of such writing or record, including lack of personal knowledge by the entrant or maker, may be shown to affect its weight, but they shall not affect its admissibility. The term "business" shall include business, profession, occupation, and calling of every kind.]

Their accuracy is not questioned. They represent, in the course of a year, perhaps millions of transactions. No one at all familiar with bank routine would hesitate to accept them as practically conclusive evidence. As proof of payment, they constitute not secondary but primary evidence.

But putting all this aside, the best evidence rule should not be pushed beyond the reason upon which it rests. It should be "so applied," as the Supreme Court held in an early case, "as to promote the ends of justice, and guard against fraud or imposition" (Renner v. Bank of Columbia, 9 Wh., 581, 597; see also United States v. Reyburn, 6 Pet., 352, 366; Minor v. Tillotson, 7 Pet., 99, 100). The rule is not based upon the view that the so-called secondary evidence is not competent, since if the best evidence is shown to be unobtainable, secondary evidence at once becomes admissible. And if it appear, as it does here, that what is called the secondary evidence is clearly equal in probative value to what is called the primary proof and that fraud or imposition reasonably is not to be feared, the reason upon which the best evidence rule rests ceases, with the consequence that in that situation the rule itself must cease to be applicable, in consonance with the well-established maxim—cessante ratione legis, cessat ipsa lex.

An over-technical and strained application of the best evidence rule serves only to hamper the inquiry without at all advancing the cause of truth. "The fundamental basis," the Supreme Court has said, "upon which all rules of evidence must rest—if they are to rest upon reason—is their adaptation to the successful development of the truth" (Funk v. United States, 290 U. S., 372, 381). There is not the slightest reason to suspect that this fundamental basis was affected in the present instance.

Robert Cedric Binkley, 1893-1940

In Cleveland, on April 11, Dr. Robert C. Binkley died after a brief illness. A scholar of broad interests and world-wide reputation, one of the founders of the JOURNAL and an associate editor until the time of his death, Chairman of the Joint Committee on Materials for Research, Professor of History at Western Reserve University, author of many books, among them the only treatise on documentary reproduction, and of numerous articles, his loss is keenly felt by the entire academic world.